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Volume 17 November 1948 Number 11

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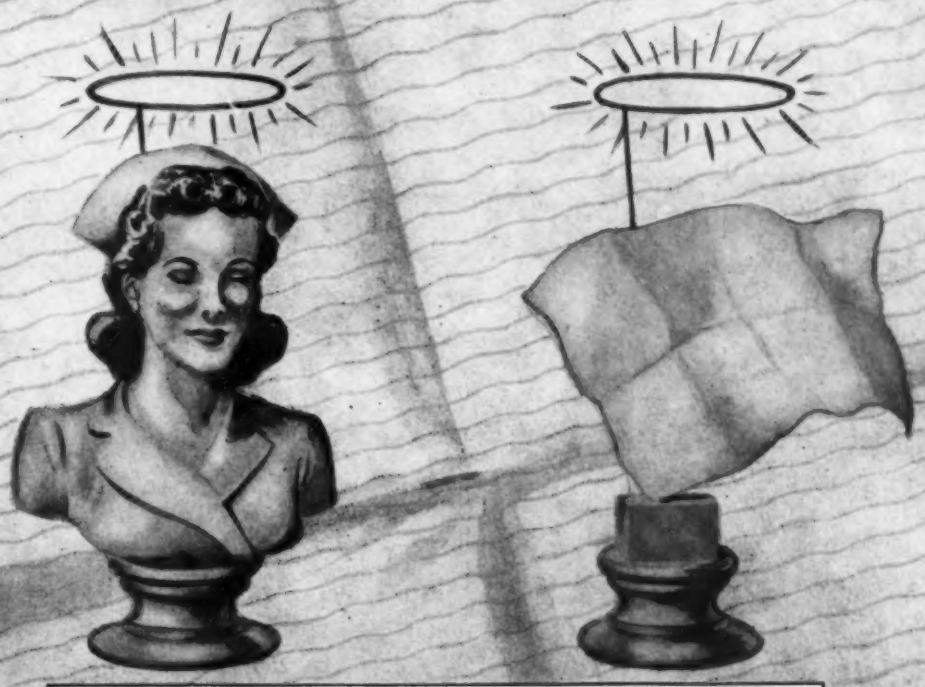

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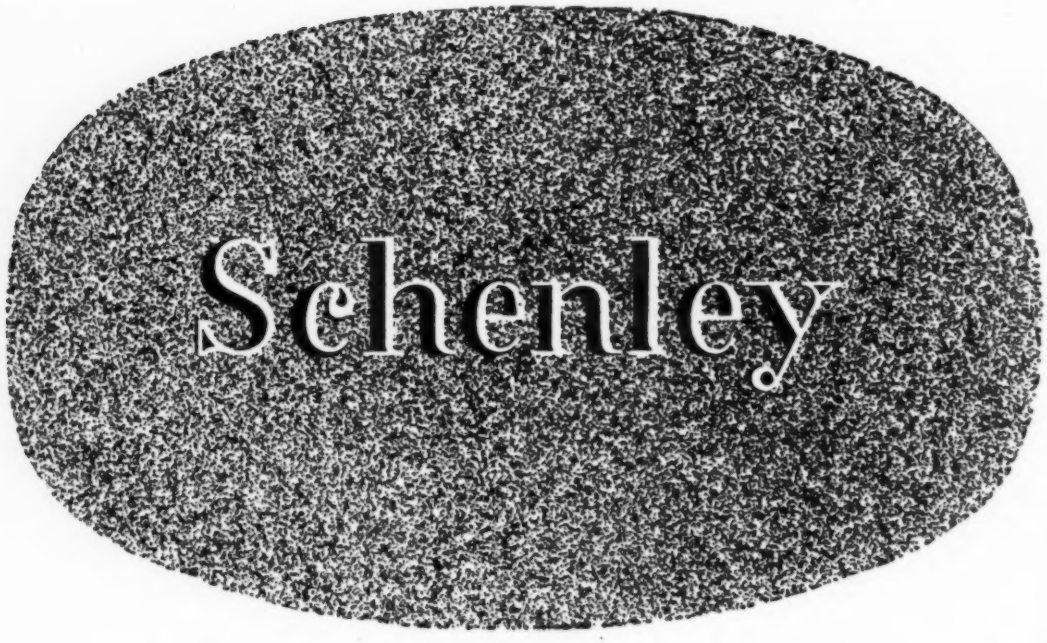

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This magazine is published to promote sound thought upon and concerning industrial medicine and traumatic surgery. To that end it will contain articles, news items, reports, digests, and other presentations, together with editors' comments. The editorial policy is to encourage frank discussion. On this basis contributions are invited. The editors will exercise care in checking on the accuracy of data printed but in all other respects articles and opinions of which expression is allowed are the opinions of their authors—the editors reserving in all cases the right to comment on the same in the current or any subsequent issues as they may be inclined.

Volume 17 NOVEMBER 1948 *Number 11*

CONTENTS

BETTER SOAPS FOR THE INDUSTRIAL WORKER
Carey P. McCord, M.D. 421
PERMANENT INTERNATIONAL COMMITTEE ON INDUSTRIAL MEDICINE, LONDON MEETING
Robert T. Legge, M.D. 427
THE CARE OF INDUSTRIAL CASUALTIES
Carlo Scuderi, M.D., Ph.D. 428
DERMATOLOGICAL HAZARDS IN THE LEATHER INDUSTRY
M. H. Samitz, M.D. 431
DENTAL MEDICINE
John A. Kolmer, M.D. 434
FIRST ARGENTINE CONGRESS OF INDUSTRIAL MEDICINE
Conclusions, Votes, Recommendations 437
THE LOCALIZATION OF FOREIGN BODIES BY X-RAY
Homer S. Elmquist, M.D., F.A.C.S. 440
METASTATIC CALCIFICATION: Is the Role of Hypercalcemia Over-emphasized as a Toxic Manifestation of Vitamin D Therapy in Rheumatoid Arthritis?
Abraham Cohen, M.D., John G. Reinhold, Ph.D., and Roslyn Cohn 442
"HEALTH HITS THE HIGHWAY":
American Brake Shoe's Mobile X-Ray 447
ON THE TREATMENT OF PULMONARY TUBERCULOSIS 449
AMERICAN ASSOCIATION OF RAILWAY SURGEONS
A Brief History
Esther H. Vincent 451
Sixtieth Anniversary Meeting
Program 452
NEWS, COMMENT AND OPINION 454
ASSOCIATION NEWS 458
EDITORIALS 460
PERSONAL NEWS 4
INDUSTRIAL HEALTH AND DISEASE 21
DR. PILGRIM 25
(ADVERTISER'S INDEX ..... 28)

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DR. J. E. M. THOMSON, of Lincoln, Nebraska, President of the AMERICAN ASSOCIATION OF RAILWAY SURGEONS, has returned from a medical teaching mission in Poland and Finland, under the auspices of the Unitarian Service Committee and the World Health Organization. After the completion of the mission, DR. THOMSON made a tour of the Scandinavian countries of Sweden, Norway and Denmark, surveying the medical and health problems and facilities of these countries. Before returning to the United States the last of September, he attended and was on the program as an essayist at the Congress of the International Society of Orthopedics and Traumatology held at Amsterdam. On his return to the States he took part as a guest speaker at the Kansas City Southwestern Clinical Society meeting.

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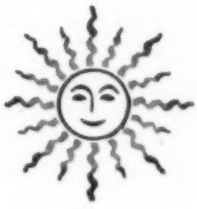

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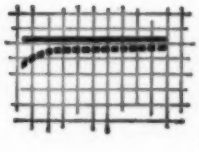

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DR. GEORGE F. WILKINS, a native of Kinderhook, New York, and graduate of Holy Cross College and Harvard Medical School, on October 1, 1948, became medical director of the New England Telephone and Telegraph Company, Boston. He had been assistant medical director since 1940, and succeeds DR. DANIEL L. LYNCH, retiring after 30 years as the company's first medical director. DR. WILKINS joined the Telephone Company medical staff in 1937. During the war he served for three years in the southwest Pacific with the 105th General Hospital Unit. Upon his return he was stationed at the Cushing General Hospital as assistant chief of the surgical service and chief of the surgical section. He is an associate in surgery at the Peter Bent Brigham Hospital, Boston, and assistant in surgery from Harvard Medical School. He is also a director of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, a Fellow of the American Medical Association, and a member of the Massachusetts Medical Society, and of the Aesculapian Club of Boston.

DR. LOUIS BAZY, Chief Surgeon of the French National Railroads, received an Honorary Fellowship from the American College of Surgeons at a Convocation held in the Philharmonic Auditorium, Los Angeles, California, on Friday evening, October 22. DR. BAZY'S work on arteriosclerosis is of particular im-

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portance to doctors in the military and industrial fields. His position as Chief Surgeon of the French National Railroads has given him extensive opportunities to study the effects of arteriosclerosis on railroad workers. The French National Railroads provide complete medical and dental care to railroad workers and their families; they possess x-ray trains, clinics, and hospitals, and have cooperative arrangements with sanatoria. DR. BAZY, who was an intimate friend of Marshal Foch, has been granted funds by the Foch Foundation to extend these medical services. During his stay here he has noted the latest advances in American preventive, as well as curative medicine, and hopes to apply the results of his investigations in the services to be established with the aid of the new funds.

Dr. Fred B. Wishard

DEATH removed one of the nation's outstanding men in the medical field when a heart attack proved fatal Thursday to DR. FRED B. WISHARD, 54, Pendleton, medical director the past 24 years at Delco-Remy Division of General Motors Corporation. Born in Teheran, Persia, in 1894, the son of a Presbyterian medical missionary, DR. WISHARD came to this country in his youth and later enrolled at Wooster college, Wooster, Ohio. After studying there four years he was graduated with high honors in 1916 and then he answered his country's call to the armed service for World War I. During the years, 1916-19, he served with the U.S. Army as a member of the Machine Gun Service, Thirty-seventh Division. Following his Army service, DR. WISHARD attended the Indiana University School of Medicine, 1919-23, and then served his internship at the Methodist hospital in Indianapolis. Early in 1924 he engaged in special practice in industrial medicine and surgery. The outstanding accomplishments of the young physician prompted General Motors Corporation officials to name him medical director of the large Delco-Remy Division here. Medical programs introduced by DR. WISHARD gained wide recognition for Delco-Remy Division throughout the industrial world. The energetic physician pioneered a plan univer-

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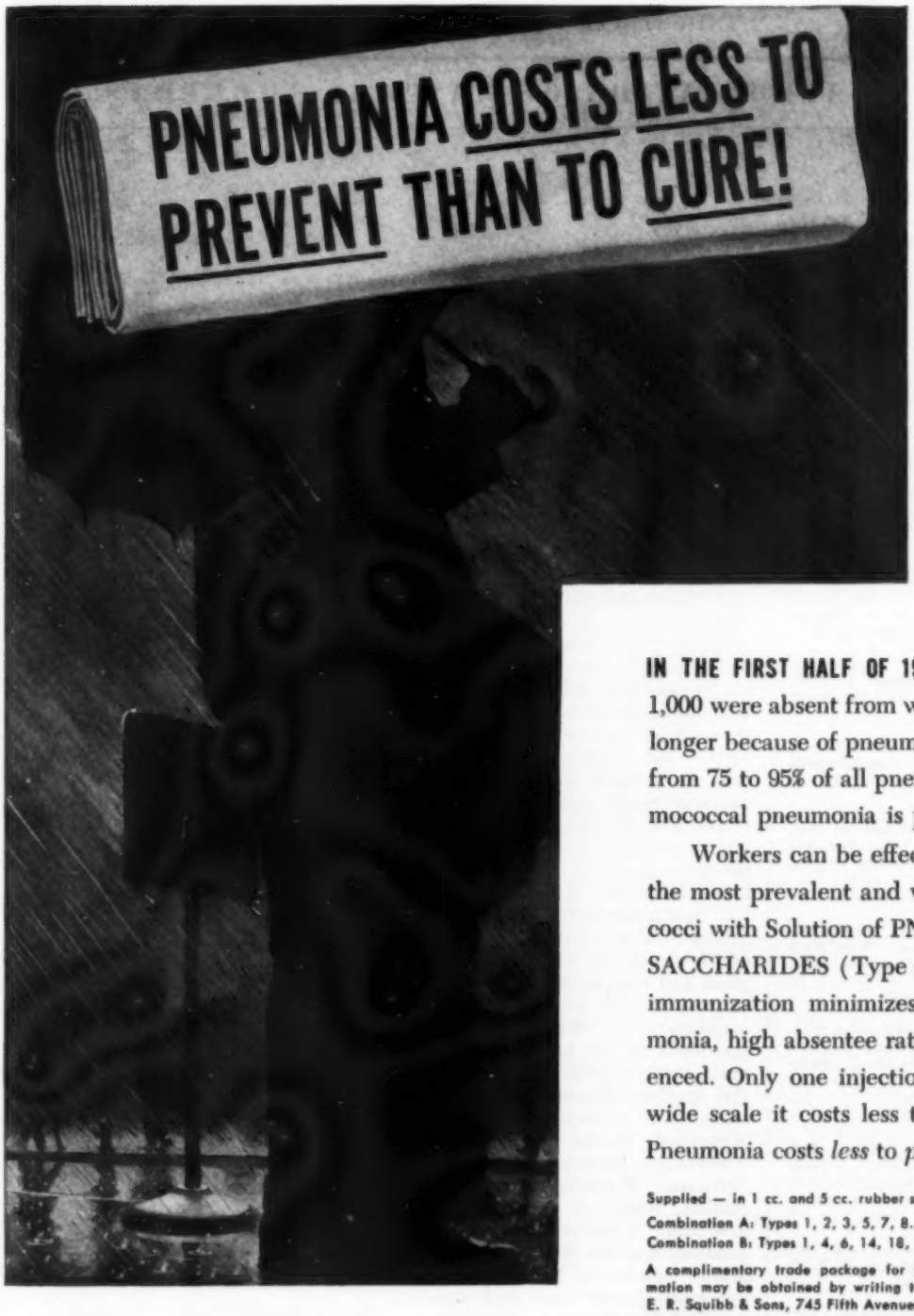

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1. Public Health Reports 62:1773 (Dec. 19) 1947. 2. Collin, M. F.: Permanente Foundation Bulletin 6:11, 1948. 3. MacLeod, C. M.; Hodges, R. G.; Heidelberger, M., and Bernhardt, W. G.: J. Exper. Med. 82:445, 1945.

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American Association for the Advancement of Science, 1515 Massachusetts Ave. N.W. Washington, 5, D. C. September 13-17, 1948.

American Association of Industrial Dentists, 4604 South helsea Lane, Bethesda 14, Maryland. V. J. FORNEY, D.D.S., Secretary-Treasurer.
Early April, 1949; Detroit.

American Association of Industrial Nurses, 654 Madison Ave., New York 21, N. Y. GLADYS L. DUNDORE, R.N., Executive Secretary.
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American Conference of Governmental Industrial Hygienists, U. S. Public Health Service, Washington, D. C. J. J. BLOOMFIELD, Secy-Treas.
Early April, 1949; Detroit.

American Industrial Hygiene Association, 4400 Fifth Ave., Pittsburgh 13, Pa. HENRY F. SMYTH, JR., Executive Secy.
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American Medical Association, Council on Industrial Health, 535 North Dearborn St., Chicago 10, Ill. CARL M. PETERSON, M.D., Secretary.

sally adopted in industrial circles for the x-ray of chests and obtaining blood tests. His great work at Delco-Remy Division and his numerous contributions to medical publications throughout the nation placed him foremost in the ranks of medical field leaders. As a result of his many accomplishments DR. WISHARD received a Fellowship in the American Medical Association. Although he followed a heavy schedule in his medical work in the industrial field, DR. WISHARD found time to serve as a member of the staff of St. John's Hospital and was active in the state, county, district and local medical organizations. He was a past president of the hospital medical staff, district medical society and the Madison County Medical Society. On several occasions he presented lectures before the American Medical Association, National Manufacturers' Association, National Safety Council and other prominent national organizations. DR. WISHARD was an active member of the First Presbyterian church here and was a devoted family man. He was a leader in Republican politics and was one of the outstanding members of the Masonic lodge in the country. Affiliated with various branches of the Masonic fraternity his activities were many and a few years ago he received the highest honor in Masonry when the Supreme Council of the Ancient and Accepted Scottish Rite conferred the Thirty-third Degree upon him.

—*Anderson, Indiana, Herald*, Saturday, September 25, 1948.

American Medical Association, 535 North Dearborn St., Chicago 10, Ill. GEORGE F. LULL, M.D., Secretary & General Manager.
Interim Session, November 30-December 3; St. Louis.

American Public Health Association, 1790 Broadway, New York 19, N. Y. REGINALD M. ATWATER, M.D., Executive Secretary.
November 8-12, 1949; Boston.

Association for the Surgery of Trauma.

Canadian Public Health Association, Vancouver, B. C., Canada.

Council on Industrial Health, American Medical Association; Secretary: CARL M. PETERSON, M.D., 535 N. Dearborn St., Chicago 10.

Industrial Hygiene Foundation of America, 4400 Fifth Ave., Pittsburgh 13, Pa. JOHN F. MCMAHON, Managing Director.
November 17-19, 1948; Pittsburgh.

International Association of Industrial Accident Boards & Commissions, MARSHALL DAWSON, U. S. Dept. of Labor, Washington, D. C., Secy-Treas.
September 12-18; New York.

Lead Industries Association, 420 Lexington Ave., New York 17, N. Y. ROBERT L. ZIEGFELD, Secretary-Treasurer.
November 15-16; Chicago.

National Council on Rehabilitation; Secretary-Treasurer: MR. HOLLAND HUDSON, 1790 Broadway, New York 19.

National Metal Congress, Philadelphia.
October 25-28; Philadelphia.

National Rehabilitation Association, 411-7th Ave., Nashville 4, Tenn. LOUIS R. SCHUBERT.
December 6-10, 1948; Madison, Wis.

National Safety Council, 20 North Wacker Drive, Chicago 6, Ill. NED H. DEARBORN, President; CARMEN FISH, Secretary.
October 18-22; Chicago.

National Tuberculosis Association, 1790 Broadway, New York 19, N. Y. H. STUART WILLIS, Secretary.

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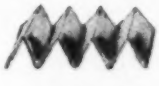
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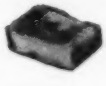
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1. Friedlaender, A. S., Friedlaender, S. (1948), Amer. J. Med. Sc., 215:530, May. 2. Friedlaender, A. S., Friedlaender, S. (1948), Amer. Prac., 2:643, June. 3. Brunsting, L. A. (1948), Canad. Med. Assn. J., 58:133, Feb. 4. Martins, J. K. (1948), Indust. Med., 17:133, April. 5. Feinberg, S. M., Bernstein, T. B. (1947), J. Lab. & Clin. Med., 32:1370, November.

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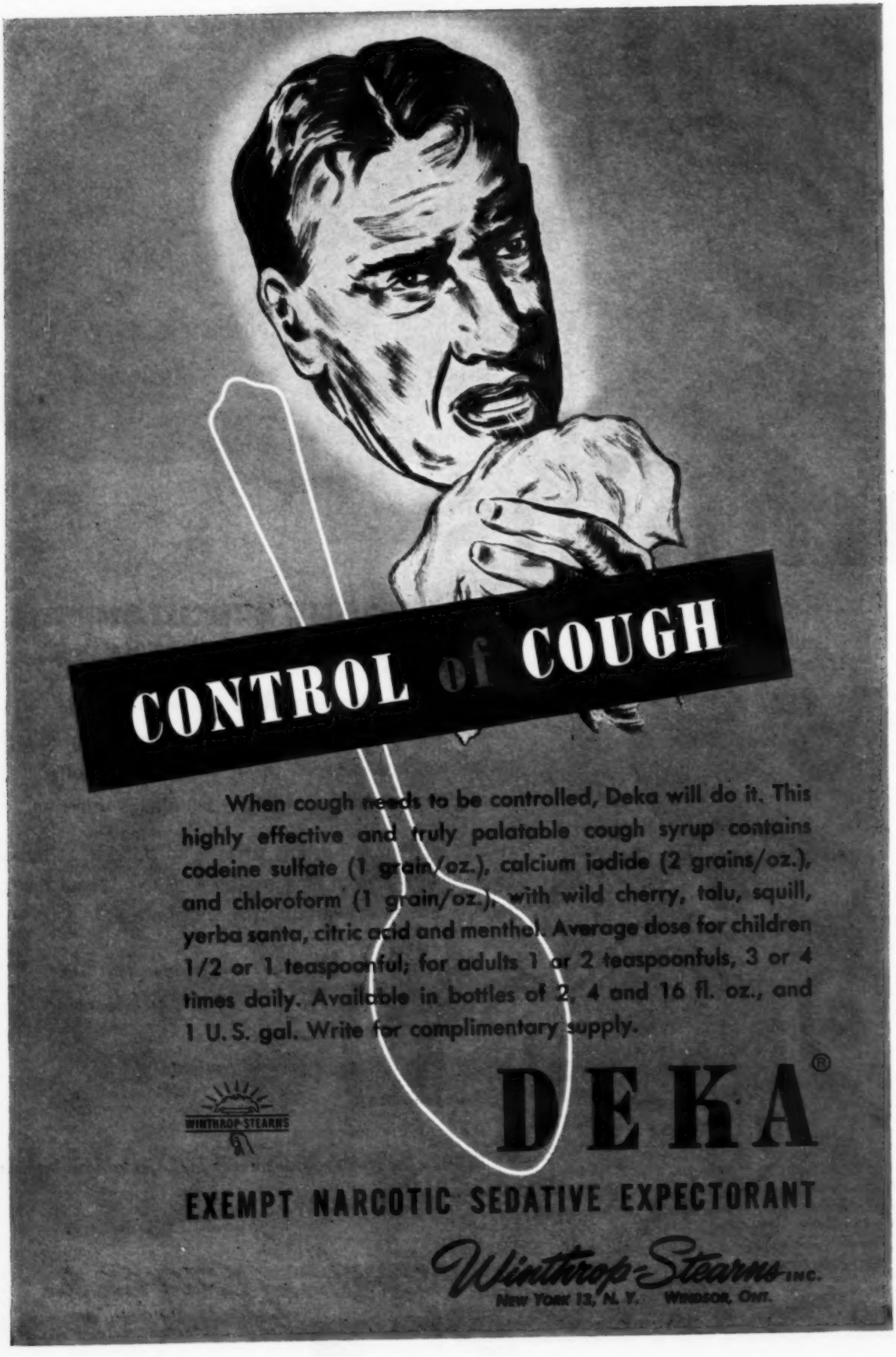
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INDUSTRIAL MEDICINE

Volume 17 NOVEMBER 1948 *Number 11*

Better Soaps for the Industrial Worker

CAREY P. McCORD, M.D.,
Detroit

NO PERSON in full measure knows the precise manner in which soaps achieve detergency. By design, that is a challenge directed to those who regard detergents and detergency as jejune topics, little meriting the printed page. Contrawise, a state of rapid evolution promises continuing betterment for every application of cleansing agents. Great is the breach between the ash hopper for lye, the bone tub for fat, and the outdoor iron pot for cooking—all tools of not too ancient soap making—and the modern manufacturer's concern in exchange resins, isoelectric zones and micelle structures of keratins.

For any detergent there are two major requirements: (1) A high degree of quick cleansing, whether applied to the skin, to fabrics, to dishes or to metals, and (2) assurance that damage will not arise in the process of soil removal. Granting wide awareness of this second requirement, any imbalance favors the efficacy of detergency. This is notable at this time for some cleaning agents concocted for the factory hygiene usage. Narrowing the general field of detergents and detergency, it becomes the chief purpose of this publication to consider the physiologic needs of the human skin in relation to soaps and other detergents and with foremost concern for the individual worker.

The Measurement of Detergency

THE individual who looks clean is not necessarily so and it may not be desirable that he achieve full cleanliness. The extremes to which surgeons go in attaining operating-room cleanliness well indicate the difficulty in acquiring stark cleanliness. Obviously, the need has long existed for some device that may measure on a quantitative basis the degree of cleanliness procured under various conditions.

For our purposes that problem was solved in the following manner: A number of special soils were devised, some of which were later characterized as standard soils and used for testing the qualities of various soaps and other detergents. The simplest of these standard soils was the dirtiest of crank case oil to which there may have been added soot. Still further to these various soils were added suitable fluorescent agents avoiding those of the color of the natural fluorescence of skin and nails. For test purposes, measured quantities of one of these soils were applied to predetermined areas of skin surface such as both hands only, or both forearms only, etc. Immediately thereafter such areas were exposed to ultra-violet light of the Wood's lamp type and on occasion to various other forms of "black" lamps. At once, the fluorescent soil came into prominence. The degree of fluorescence was measured by an electronic photometer registering in arbitrary units. On this soil one or more readings were recorded. Thereafter, standard washing with a particular soap or detergent under study was carried out, employing measured amounts of the cleanser with washing limited to a fixed time, usually three minutes. Readings were recorded and the diminution in fluorescence noted. Other washings were carried out until none of the implanted fluorescent soil remained or, in some cases, when no further soil could be removed by further washing. Through this device it became possible to compare the detergent qualities of any one agent against any other, also to appraise the effect of temperature of the washing water, the influence of time, the effect of previous washing, the efficacy of protective creams, etc.

A striking result from this quantitative measurement of detergency was the determination that it is almost impossible to remove every vestige of artificial soils. It became apparent that more damage on occasion might be wrought by excessive scrubbing than by leaving traces of soil in place on the skin. There is scant reason to believe that the average workman in the heavy industries frequently attains photometric cleanliness, or that he should.

With this apparatus we have appraised the detergent qualities of numerous household and industrial soaps. The most effective cleansers are not always the most acceptable on a physiologic basis.

Nature of Soils

UNLIKE fabrics, dishes and metals, where the soil is always exogenous, human and other animals present an additional soil—the autochthonous. The exogenous soil represents dirt, grease, grime, dust and bacteria implanted on the body surfaces from external sources. The autochthonous soil is of body origin and represents secretions and excretions, dead and dying cells and whatever else reaches the body's surface from within. Some bacteria may derive from external sources, some from the body itself.

From The Industrial Health Conservancy Laboratories, Detroit, Michigan.

The investigations leading to this report were carried out under a grant from the Sugar Beet Products Company, Saginaw, Michigan.

Manifestly, these two types of soil are not stratified but are intimately mingled. It is impossible to remove one without removal of the other. Since the autochthonous soil serves a useful purpose, it would be desirable to remove the effete material of external origin leaving behind the protecting barrier originating within the body. This is both impossible and improper since eventually the autochthonous soil itself reaches a state of quantity and odor as to be unwanted.

Ordinarily, the soil of workers' hands is comparable to that of the home or the farm but with many exceptions. It is to be recognized that many industries provide coatings from soiling substances that defy removal through faithful application of any practical soap. Usually these paints, lacquers and other coatings require dissolving and wide use is made of various hydrocarbon solvents—naphtha, turpentine, acetone, ketones, etc. A fair portion of the dermatitis in industry directly is attributable to haphazardly chosen solvents for these highly resistant soils.

Physical State of Soaps and Detergents

BODY cleaning agents are available in cakes, powders, liquids and pastes. All of these states lend themselves to preference under different circumstances. In offices and many light industries, workers prefer cake soap but difficulties quickly arise. Cake soap is suited to the inclusion of mineral abrasive but does not lend itself to vegetable abrasives frequently helpful in proper cleansing. The issuing of individual cakes of soap is highly uneconomical. The soap is wasted, lost and carried away. Cakes of soap are frequently thrown into toilets, effectively plugging that facility. All considered, the acceptable uses of cake soap in industry are limited.

Liquid soaps have drawbacks but dissimilar ones. The fatty acids suited to liquid soap are those most likely to induce dermatitis (e.g., coconut oil). This objection does not necessarily apply to liquid synthetic detergents. Manifestly, abrasives of no sort may enter liquid soaps and the need for abrasives often is genuine. Liquid soaps commonly are potassium soaps.

Powdered soaps appear best suited to the needs of industry. Such soaps are economical, may be dispensed readily, may not be easily removed from the premises, are subject to little wastage and may contain scrubbers.

Paste soaps have many of the disadvantages of cake and liquid soap and few superiorities over any—at least in industry.

The Skin's Acid Mantle

THE surface of the healthy skin is substantially coated with acid. This acid originates in sweat with some contribution from the sebaceous glands. In sweating the chief single acid component is lactic acid which may comprise 0.25% of the total. As sweat evaporates, concentration of this and other components increases. This and other acids mingled with the dead and dying cells of the skin make up the skin's acid mantle. During the summer months the quantity of acid is such as to provide pH values, usually between 4 and 4.5. Rarely lower values to 3.5 may be demonstrated.

The extent of skin surface acidity is highly variable. With the coming of colder weather and depressed sweating, the acid mantle is well reduced. In children the mantle is usually more pronounced than in adults. The menstrual cycle of women leads to alterations in the state of skin acidity. Various portions of the skin's surface present different levels of acidity, in part, depending upon the number of secreting glands there present. At any one point the level may undergo distinct variations within the period of a few hours. The palms of the hands are most likely to retain a high degree of acidity.

It does not follow that the person who perspires most freely regularly will present the highest degree of surface acidity. When perspiring is prolonged gradually sweat becomes less acid and even alkaline. The well known high incidence of industrial dermatitis in hot weather may be influenced by the alkalinity following profuse sweating.

More and more it is becoming established that the acid mantle aids the skin in resisting the action of bacteria and chemical irritants.

Alkalis from detergents tend to deprive the skin of its protective acid coating. Many tap waters are sufficiently alkaline to produce immediate reduction in skin acidity. The duration of partial acid deprivation after a single washing with some soaps is prolonged. A single washing with a few otherwise good soaps may reduce skin acidity for 16 hours, but the average is far lower. Since, commonly, several washings have to be carried out in the course of a 24-hour day, that portion of the skin washed repeatedly may lack any high degree of acidity.

One example of the effects of depressed skin acidity may be found in that highly prevalent condition known as "winter itch." Undoubtedly, there are many causes or factors in the production of this affection. One is associated with the diminution in sweating with some loss of skin acidity together with further affront from the alkali of soaps. The majority of individuals may dispose of "winter itch" merely through the curtailment of bathing or, at least, the curtailment of the use of soaps.

One of the desirable qualities of any detergent is that it shall exercise little or no destructive action on the skin's acid mantle.

Scrubbers in Soap

THE workman who carefully cleans his body with a wash rag in the morning may complain actively when asked to depend upon a powdered soap with a vegetable abrasive, at work. He fails to realize that a scrubber is but a powdered wash rag and that such mechanical abrasive, either at home or at work, promotes soil removal. However, there are desirable and undesirable abrasives.

Mineral abrasives are the only ones suited to cake soap, since ordinarily vegetable particles in cake soap swell up and lose their abrasive quality. Otherwise, mineral abrasives are less commendable. Although the particle size may be small and the mass action limited, the inelasticity of mineral particles induces microscopic skin abrasions and thus exceeds the desirable degree of mechanical scrubbing.

Organic scrubbers are preferred. The practical number includes cornmeal, woodmeal, corncob meal and pulverized nut shells. It might be assumed that almost any particulate organic substance might be satisfactory. Such is not the case, since essentially all fail in some respect. For example, ground cellophane provides a "feel" in soap that, at once, leads to rejection.

Of the several practical vegetable abrasives, cornmeal at this time is most favored. Corncob meal is usually rated second, woodmeal third. Walnut shell meal has the disadvantage of dark color which, ordinarily, is regarded as objectionable, although this does not influence its scrubber action.

Whatever the abrasive selected it becomes desirable that it be present in more than one particle size and possibly in different degrees of particle hardness. The objection to vegetable abrasives is, being insoluble, they increase unsightliness around the washing point. However, these insoluble scrubbers do not clog plumbing and, in fact, tend to remove some accumulations along piping. In the case of cornmeal, a further possible objectionable quality is related to the appearance of "weevils" in untreated meal. Through the use of ultra-violet light of proper Ångström length or a method based on high pressure "blasting," these weevils and their ova may be destroyed in the manufacturing process.

A further function of vegetable abrasives develops whenever liquid detergent ingredients are introduced into powdered soaps. The scrubber becomes the carrier of such liquid constituents.

The limited aversion to vegetable scrubbers should disappear with the knowledge that they serve a function similar to the well accepted wash rag.

Hydrolysis in Soaps

HYDROLYSIS, in general, is the term applied to the chemical interaction between water and any substance, resulting in double decomposition, in which the ions of water constitute one of the reactants. Hydrolysis, as applied to soaps, involves the customary double decomposition with a liberation of free acid and alkali but with an excess of the free alkali. Other components may be formed. In the quest for an explanation as to how soaps clean, for a long period it was believed that alkali liberated through hydrolysis was the precise detergent agent. It is now known that such is not the case. Detergency may occur in the absence of all alkali.

The extent to which decomposition of soaps is accomplished through hydrolysis, is highly variable, the chief determinants being the original fatty acid entering the soap, the temperature at the time of hydrolysis, and molarity. Under the most favorable circumstances, rarely existing in actual washing, as much as 80% of the soap may be hydrolyzed. It appears probable that in usual washing practices with commonly available soaps, not more than 20% of the soap is hydrolyzed. This means that somewhat less than 20% of the initial alkali entering the soap may be liberated as active alkali. Apart from the alkali builders, elsewhere discussed, this alkali from hydrolysis is perhaps most responsible for whatever damage may be wrought by alkalis from any source.

In the absence of alkali builders whatever damage may be directed upon the skin's acid mantle, chiefly, is to be attributed to this alkali of hydrolysis.

Easily, the development of alkali resulting from hydrolysis may be demonstrated by the addition of liquid color indicators in hands in the process of washing. At the outset no color may be observed. As more water is added and lather is worked up, there come about color changes indicative of the liberation of alkali.

Hydrolysis is an inherent reaction of all soaps in the presence of water. However lacking soaps may be in free alkali, there is no escape from the formation of some alkali through hydrolysis in the washing process.

In the case of synthetic detergents many may hydrolyze, but the formation of free alkali is not characteristic of all.

Hydroxyl Ion Receptors, Exchange Resins, Etc.

FOR a number of years it has been known that ordinary water may be altered to approach the quality of distilled water through chemical action alone. This results from the properties of exchange materials. Some of these substances, chiefly resins, absorb sodium ions and at the same time release hydrogen ions in comparable numbers; in others the process is just reversed. It has been deemed probable that the same action may take place in connection with the hydrolysis that always occurs from soap use. Obviously, it would be of advantage if the sodium ions liberated in the hydrolytic process might be taken up by exchange substances with corresponding liberation of acid ions. Such does occur, but continuing hydrolysis makes available a continuing number of sodium ions, at least in the absence of practical quantities of the exchange substances. When alkali builders are present in soaps the quantity of alkali provided along with alkali of hydrolysis is so great as to overtax the capacity of exchange material in any quantity suited for inclusion in a detergent. In the absence of such builders and in the case of certain soaps, effective results may be obtained to the end that the total quantity of available alkali is inconsiderable.

The degree of destruction of the skin's natural acid mantle is measurably retarded.

Alkali Builders

IN THE fabrication of soap, the combination between the alkali base and the fatty acid is so perfected that little free alkali remains. Roughly, the proportion of the strong alkali and the weak acid is such that the approximate ratio is one to nine. Any lack in precise combination favors an excess in fatty acids. This excess may lead to soap rancidity in the absence of preservatives on which account suitable preservatives, in traces, may be introduced. Legal safeguards demand that the quantity of free alkali shall not exceed one-half of 1%. This allowable limitation is seldom reached even in coarser laundry soaps. Notwithstanding, soaps are seldom precisely neutral. In the soap industry, that term "neutral" soap designates those products that do not contain additives in the form of alkali builders or extenders. The better grades of toilet soap and those created for fine fabrics are neutral soaps in that they contain no alkali additives. Other household soaps and most industrial soaps for human use contain varying percentages of these alkali creators. The number includes soda ash, sodium silicate, borax, trisodiumphosphate and sodium pyrophosphate. The purpose of these alkali builders is to lessen the quantity of soap required, to extend the action of soap, to soften the water and to diminish the amount of clean-up work after washing. To a limited extent, some alkali builders from their physical state serve as scrubbers.

Granting some values in alkali builders, they contribute appreciably to the totality of available alkali and serve as the physiologic enemy of the skin through destruction of the acid mantle. It appears established that alkali builders are detrimental to industrial hygienic soaps in so far as conservation of the skin becomes a consideration.

Superfatted Soaps

MANY soaps including some of the finer toilet soaps, some soaps designed for medical use, and some industrial hygenic soaps are superfatted. Such soaps include fats in quantities higher than essential to saponification. Lanolin and tallows are representative of such agents. Theoretically, it appears that superfatted soaps provide a residual emollient for the skin, thereby replacing in some degree the natural oils of the skin removed in the process of detergency. Further, in hydrolysis from washing it has been assumed that the excess fat combines with the alkali liberated. Such assumptions may be unfounded or little founded. Just as the natural oils enter into the emulsion and to some extent are removed, so these superfatted agents enter and impose an increased burden on the soap. Thus, more work is required of the soap. The soap is less efficient as a cleansing agent and more soap may be required. From our own observation, oily emollients tend to retard the immediate flow of sweat after bathing and on this account may hamper the rapid return of the acid mantle.

Synthetic Detergents

ALL SOAPS are detergents but not all detergents are soaps. Water, obviously not a soap, is a detergent. Lately, there has come into wide acceptance a new lot of detergents commonly referred to as "synthetics." The possible total is legion. At the present time no fewer than 500 are in use but not all in the hygienic field. At once it is pertinent to inquire if, through the use of these synthetics, the undesirable qualities of soaps may be escaped? Many synthetics have proved to be skin irritants, some provoke excessive skin drying, some have pH values as high as the unwanted soaps, others are so active as wetting agents as to be physiologically undesirable. For those who condemn synthetic detergents solely because of wetting properties, it may be pointed out that both water and soap solutions are wetting agents.

About the year 1930, it was determined in Germany that sodium salts of certain alcohol sulphates possess properties like soap. Subsequent development has led to a substantial new industry with the annual production of more than 600 million pounds of synthetic detergents, chiefly directed to the following classification: alcohol sulfates, alkyl aryl sulfonates, alkyl sulfonates, sulfated-sulfonated amides, sulfated-sulfonated esters and sulfated-sulfonated amines. McCutcheon (Synthetic Detergents, McCutcheon, J. W., Chemical Industries, November, 1947) thus describes some properties of synthetic detergents:

"One main advantage synthetic detergents have over soaps is the fact that their lime and magnesium salts are fairly water-soluble and do not precipitate from hard water. Too, synthetics can be used in an acid medium and still retain their detergent and foaming properties. Particularly in these two respects do the synthetics differ from soap.

"Both soap and the synthetic products are, of course, surface-active agents. Structurewise, too, they are fundamentally similar. All surface-active agents are characterized by having a molecule which carries a hydrophobic (water-hating) hydrocarbon tail and a hydrophilic (water-loving) head. When a detergent dissolves in water the surface molecules are oriented so that their cationic heads point toward the water and the hydrocarbon tails away from it. . . .Significantly, the hydrophobic tails are in a unique position to attach themselves to oil or hydrophobic materials such as 'dirt.' In soap's case the attachment for the dirt is strong enough to permit it to be emulsified and carried away in the rinse water."

This same author makes distinction between detergents, wetting, disbursing, emulsifying and penetrating agents. Within these categories, this author lists some 500 synthetic detergents furnishing trade name, manufacturer, chemical classification and principal uses. That publication, together with the book "Medical Uses of Soap" (edited by Morris Fishbein, M.D., J. B.

Lippincott Company), affords adequate information as to the place in the world of detergency occupied by synthetics.

Slowly, the fact emerges that on the basis of selection some synthetic detergents possess properties and actions that serve the requirements of skin hygiene. That is, some with acceptable deterging properties are not outstanding as skin irritants, are not sensitizers, do not induce excessive drying and are not objectionable as wetting agents. Even so, no quick shift to a widespread or universal reliance on synthetics is expected. The ultimately best items in this field probably not yet have been created but, even at the present time, some synthetics foremostly promoted for laundry purposes are better suited to skin requirements than some soaps directly sponsored for hygienic use. The more immediate prospect is that the mounting annual sales now marking the synthetic output will lead to modification in hygienic soaps that will provide products better meeting physiologic needs. In no sense may it be anticipated that soaps will disappear from their accustomed place on the washstand or bath tub.

Rinsing

IN THE presence of soap on the skin in the washing operation, the chief action is that of loosening the soil through emulsification, skin wetting, etc. Actual disposal of the loosened soil can only come about through rinsing. In and out of industry, and for all ages, neglect of rinsing is commonplace. Many persons elect to substitute towel drying for rinsing even when, visibly, much soap remains. No amount of towel drying will remove all such soap. This may be demonstrated by asking an individual who has neglected rinsing again to wash in plain water. Promptly, further sudsing may be produced. Unrinsed soap on the skin perpetuates alkali removal of the acid mantle.

While the emulsion between soap and soil is being created, scantiness of water is desirable but, thereafter, and particularly during rinsing, the free use of water is commendable. Soaps of low titer in well balanced formula are more readily rinsed off.

Sudsing

THE soap manufacturer has available such abundant material resources that, on demand, he may impart almost any physical characteristic to soaps. As to sudsing, he may furnish rapid or slow sudsing, large bubbles, small bubbles or no sudsing. Workers may be highly sensitive to soap qualities. They are prone to demand rapid detergency, flash and profuse sudsing and bubbles. Many manufacturers stultify their knowledge as to best soaps and instead furnish products conforming to the whims of the workers. The worker may be the poorest judge of soap excellence.

While no man knows the exact mechanism of detergency, that which is known is well stated by contributors to "Medical Uses of Soap." Kooyman and Halberstadt note:

"The various steps depicted do not necessarily take place in the given sequence; they are more likely to occur simultaneously, mutually supplementing one another.

1. The detergent, on dissolving, lowers the surface tension of the water. This permits more intimate contact between the water and the material to be cleansed (fabric, skin, etc.), and enables the solution to penetrate between the material and the particles of soil.

2. The solution emulsifies and to some extent dissolves any grease or oil that may be present.

3. Insoluble particles of dirt are wetted, surrounded, and held in suspension by the detergent solution.

4. Mechanical action aids in loosening the soil from the surface to be cleaned.

5. The solution and the suds or lather, containing emulsified or dissolved oil and grease and suspended dirt, are rinsed away."

And Sulzberger and Baer state:

"The present-day concept of the cleansing action of soap may be expressed as follows: The emulsifying action of the soap-in-water solution leads to a rupture of the interface between the skin itself and the materials deposited on the skin. In place of this interface, interfaces between the skin and the soap solution and between the removable materials on the skin surface and the soap solution are established.

"This, therefore, presents two ways in which insoluble materials on the skin are removed:

1. The emulsification and removal of the soluble materials, which contain insoluble materials in mixture or suspension, will simultaneously bring about the removal of the contained insoluble materials; and

2. The wetting action of the soap solution effects a loosening of the sorption compound formed by the insoluble materials and the cutaneous surface, and thus permits and facilitates their removal."

From these descriptions it appears that the procurement of suitable emulsion is the prime consideration rather than profuse foaming. Most manufacturers would prefer to furnish flash sudsing followed by secondary sudsing of fine bubble emulsion. By this creamy, velvety type of emulsion followed by profuse rinsing, soil is best removed.

Germicidal Action, and Soaps and Body Odors

WATER alone and soap solution in themselves lessen bacterial numbers on the skin. In some measure, this accomplishment constitutes only a part of the general removal of soil. In addition, at least some unmedicated soaps possess some degree of bactericidal and bacteriostatic action. This property commonly is more demonstrable with increase in wash water temperature.

No amount of skin scrubbing with soaps will result in complete skin sterility. Although the surgeon chiefly depends on this procedure he

still makes use of sterile surgical gloves. Scrubbing on the part of a workman comparable to that of the surgeon is obviously undesirable. Such a step in industry might promote rather than retard skin infection and other skin damage.

Some soap manufacturers, for sales reason, are captivated by the possibilities of incorporating germicides in their product. Few chemical germicides are active in soaps and at the same time are harmless. Occasionally, dermatitis or sensitization may be induced by these anti-bacterial agents. Some bacteriocides lose activity in the presence of soap in concentrations that are effective in aqueous solutions. Some such agents depreciate the germicidal qualities of soap itself. In so far as antiseptic soaps are harmless, no objection to germicidal inclusion may be registered. At the present time, the two germicidal agents best regarded for inclusion in soaps are mercuric iodide and dihydroxy hexachloro diphenyl methane. At this time the inclusion of no germicide is sponsored as essential to a good industrial soap.

In health, those body odors that originate on or from the skin foremostly derive from glandular secretions. Fresh sweat from the eccrine glands is non-odorous but fresh sweat from the apocrine glands at once may be odorous. When sweat dries on garments it is still not necessarily odorous but many garments do become highly odorous from decomposing sweat. At the present time, some opinion runs to the end that any sweat may become odorous through prompt decomposition from bacterial action. Some validity may be granted but the situation is not fully accounted for on that basis. Some odorous sweating may be peculiarly related to the emotional state. One odor may arise on a speaker from apprehension during the making of a speech but the same person, if chased up a tree by a dog, might present a different odor. Instead, if he were exhausted from merely climbing a tree but without fear a third type of odor may arise. It may be doubted that bacteria are so selective. In addition to inherent odors from apocrine sweat, other body odors may be occasioned by residual bacteria on skin surfaces. Ordinary washing tends to remove body bacteria and odors. If the incorporation of germicides in soap diminishes odor-producing bacteria to the point that less frequent bathing is required, a useful purpose will be served. Resort to mild deodorants is preferable to excessive bathing for odor removal. Some deodorants are active skin irritants and may not be applied indiscriminately. Most male workers are averse to any body deodorant use. No less, they may profit by learning that the judicious use of deodorant may better serve their interest than endless bathing.

To the uninitiated it would seem highly desirable to incorporate the active chemical deodorant such as aluminum chloride into soaps. Actually, any such high acid agent quickly "kills" soap so that it is no longer serviceable as soap.

Comment

A NUMBER of less significant items related to detergents and detergency scarcely lend themselves to inclusion under any of the foregoing captions. Some are now presented as isolated statements:

1. When sensitization arises from the use of soaps or detergents, responsibility more often lies not with the soap itself but with some minor additive such as the perfume or coloring material.

2. By no means is any one soap necessarily suited to satisfactory use with every water. Hard waters may place an unusual burden on soaps, thus making plausible some inclusion of alkali builders, but only rarely in soaps intended for hand washing. Synthetic detergents are likely to be more acceptable than soaps when the mineral content of the water supply is high. When any reputable soap apparently fails to serve acceptably, examination of the water quality is in order. Soap manufacturers may provide this service and make soap adaptations suited to the situation.

3. Washing in warm water is always preferable to attain the best results from soaps.

4. Wash room janitor work is usually less in the presence of soft waters and from the use of synthetic detergents. Manifestly, the wash basin "ring" is attributable to water insoluble soaps produced by hard water.

5. Those oils representing fatty acids of low molecular weight are prone to be more irritating to the skin than those with high molecular values. An example of the former is coconut oil and of the latter, cottonseed oil.

6. Mildness in soaps frequently is associated with a high pH value. The mere fact that some soap is known to possess pH at or near 10, or even higher, should not necessarily lead to condemnation. More important than the pH is the total alkalinity—that is, the titratable alkalinity. A high content of alkali at some pH level as 8.5 may be much more injurious to the skin than another soap with a pH at 10, but present only in low quantity.

7. While soaps are commonly regarded as inherently basic, it is possible to produce acid soaps but it is not known that these lend themselves to hygienic purposes.

8. Sea water is little usable with ordinary soaps. For ocean travel, special soaps are ordinarily required and supplied.

9. Soaps containing mineral abrasives are sometimes favored for persons afflicted with acne. In this disease, the mechanical abrasive action commonly unwanted, may be beneficial.

10. The highly pleasant "feel" of the skin wanted by many soap users after washing, actually may represent a mild degree of skin damage.

11. The pathogenic organisms more readily destroyed by soap solutions include streptococci, pneumococci, meningococci, diphtheria bacilli, influenza bacilli and spirochetae pallidae. Staphylococci are more resistant.

12. Soaps produced from high molecular weight fats, while less active as skin irritants, are also less active as germicides.

13. An ordinary washing involving a thick lather represents about an 8% soap solution in the laving water.

14. The bacterial flora of exposed portions of the body are customarily referred to as the transient flora. The persistent flora occupy clothed body areas. The transient flora are usually subject to rapid changes in bacterial numbers and varieties. The transient flora are likely to embrace more pathogenic organisms.

15. However undesirable frequent bathing with soap and water may be, certain values are to be attached to the feeling of cleanliness and comfort.

16. In some skin disease states, increased use of soap and water may be desirable (e.g., impetigo), but otherwise there are a number of conditions in which unrestricted use of soap is contra-indicated (e.g., fungal infections).

Summary

MANY soaps designed for the industrial worker, although superb detergents, fail to serve the physiologic functions of the skin.

Alkalis on the skin from any source, including soaps, favor skin damage.

Preservation of the skin's acid mantle is of physiologic import.

Properly selected synthetic detergents are acceptable as skin cleaners.

For practical purposes in industry, powdered soap usually is the physical form of choice.

Organic scrubbers serve a useful program in the skin cleaning procedure. They are not mere fillers or diluents. They are the equivalent of a powdered wash rag. Thorough rinsing is an essential part of washing.

London Meeting of the Permanent International Committee on Industrial Medicine

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THE permanent members of this organization met the day before the Ninth International Congress on Industrial Medicine which convened on September 13-17 at London. The meeting was called to order by PROFESSOR P. MAZEL, of Lyon, France, and PROFESSOR LUIGI COROZZI, of Geneva, the Secretary General, read the report of the activities of the organization since the last regular meeting 10 years ago in Frankfurt. On the agenda, besides the regular order of business, were many important questions to be discussed. Of about 50 members present, DR. ROBERT T. LEGGE was the only one from the United States. It was voted to have a third vice-president, and DR. A. J. ORENSTEIN of Johannesburg, South Africa, was elected. It was also decided that in the future the Congresses are to be held every three years instead of every four years, on account of the great strides that are being made in occupational medicine. The Tenth Congress was voted to be held in Lisbon, Portugal, in 1951. Four new members were nominated for permanent membership to represent the United States, namely, DR. JAMES G. TOWNSEND, DR. CAREY P. McCORD, DR. G. H. GEHRMANN, and DR. LEONARD GREENBURG. PROFESSOR L. TELEKY, formerly an Austrian member, now an American citizen, will be hereafter listed among the U. S. membership.

It was proposed by a member of the committee that the Industrial Nurses Association, whose membership presented two excellent sections in the field of industrial nursing at this Congress, should be recognized with some official relationship in the Permanent International Committee on Industrial Medicine. This proposal was placed on the agenda of the next meeting.

The crowning event of the meeting was the election of THOMAS E. A. STOWELL, M.D., F.R.C.S., the Chairman of the British Organizing Committee for the Ninth International Congress on Industrial Medicine, London, as President of the Permanent International Committee on Industrial Medicine. DR. STOWELL served as surgeon specialist in the British expeditionary forces, 1914-1918. He is honorary surgeon to several hospitals and clinics in London, Fellow of the Royal Society of Medicine, Fellow of the Royal Institute of Public Health and Hygiene, Chairman of the British Committee of the International Congresses on Industrial Health and Safety, and an educator who holds membership in many scientific and medical societies.

The Care of Industrial Casualties

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THE prime objective in the care of industrial casualties is the rehabilitation of the patient which should be done as quickly as possible and with the minimal amount of ultimate specific disability. In order to accomplish this a closely integrated machine is necessary with each part of the machine doing its share efficiently.

Naturally, the financial angle comes into the picture but purely in a secondary role. The needless expenditure of money is a liability for the company, and one which is the result of inefficient administration and poor medical care. Nothing is so expensive as incompetent medical care when considered in terms of suffering, deformity, prolonged convalescence, and a high specific loss of the use of the working man. For this reason it is to everyone's benefit to get the best medical talent possible in the handling of the industrial casualties.

Administrative Set-Up

IN A program which nationally involves millions of dollars, an efficient administrative set-up is necessary. Naturally, no one set-up is suitable in all cases because of differences in the distribution of liabilities, sizes of the companies, and the number of risks involved.

In general, however, the following suggested administrative set-up lends itself readily to the needs of most industrial organizations, and is elastic enough to permit conformation to the specific demands of most large insurance companies in regard to many industrial risks.

The home office of each insurance company does best if there is a full-time Chief Surgeon who does only administrative work, preferably one who has had actual medical experience and who possesses administrative ability.

In most instances a surgeon of known ability with a very active practice has neither the time nor the ability to handle the administrative work well. The converse is also true; a good administrator is rarely a good surgeon. A surgeon with administrative ability who devotes a great deal of time and effort in becoming a good administrator usually does so at the expense of his ability as a surgeon. Hence, complete separation of administrative activities and active surgical practice works best. The duty of the Chief Surgeon in the home office should be to advise the insurance company in questions of specific disability, medical cost, and competent doctors in districts where the company is carrying industrial liabilities. In a relatively short period of time, he should be able to draw very accurate conclusions as to which doctors are doing outstanding work and which ones are just going along.

In large industrial areas insurance companies should have some one to handle the local medical problems, and this individual should be responsible only to the home office and the Chief Surgeon at the home office. If possible, either a Regional Chief Surgeon should be employed to do some administrative and surgical work, or a Chief Claim Adjuster who has been in the business a long time, understands the administrative work well, and is well versed in the question of medical care, compensation claim, and specific disability. It would be this person's duty to delegate the medical work and see that the difficult cases received competent medical attention.

Over a period of years it has been shown, beyond all question of doubt, that better medical care with less over-all expense results if the cases are treated by specialists in that particular field of medicine. In cities having medical centers this is feasible but hardly possible in smaller communities. In the latter case, the best medical talent available in that community should be obtained.

Specialists in true categories are necessary. Among these will be included doctors who see the greatest number of cases, such as the orthopedic surgeons, general surgeons, and general medical men; and those who see a lesser number of cases, such as the neuro-surgeons, ears, nose and throat specialists, eye specialists. dermatologists, and neuro-psychiatrists. These men should be readily available and all major injuries or complicated cases sent to them as soon as the need is detected.

In a program as large as this, local industrial surgeons or plant physicians play a most important role. They are the men who see the case first and render the first treatment. They must decide which cases can be safely handled by themselves and which ones should be referred to men in a specialist category. Over-zealous men and those who do not recognize their limitations in this bracket of the administrative plan are a very definite menace. A good Regional Chief Surgeon or a well-qualified Chief Claim Adjuster can size up this situation and, if necessary, correct it in a brief period of time. In order to make this program work well, it is imperative that all serious cases be reported as soon as they occur so that adequate care can be rendered.

First-Aid Care

THE term "First-Aid Care" is very frequently misunderstood. Usually too much is done by

those who know too little. Unnecessary probing of wounds, inspection with unsterile instruments, and further contamination by haphazard attempts to stop inconsequential bleeding all add their toll to the unsatisfactory outcome of a case.

The immediate application of a sterile pressure dressing prevents further contamination and stops the bleeding which is usually alarming to the patient and his friends. One must remember that hemorrhage, even from a large vessel, can be stopped by judicious local pressure.

The psychological shock and pain should be treated before the patient is moved from the site of injury. Morphine for pain, water or hot coffee for thirst, and the prone position for light headedness or fainting constitute the entire gamut of "First-Aid Care."

At the doctor's office or the medical department of a large plant, inspection of the wound should be done to determine whether the case is trivial and can be treated in the office or whether the case should go to the hospital.

It is of vital importance that ALL CASES with injured tendons, nerves, or compound fractures should be sent to the hospital for further care, regardless of how well-equipped an office may be.

Some industrial offices have an increasing tendency to do more and more operative work in their office. Yearly, many cases are seen by consultant orthopedic surgeons in which attempted tendon or nerve suturing has been done in the office, usually under local anesthesia and no constrictor. As if this in itself were not serious enough, in some isolated instances the work has been done by medical students working in industrial care. Yes, it must be recognized that occasionally a case turns out favorably, but, much like in a horse race, it is awfully hard to pick a winner and any sensible doctor knows this.

Hospital Care

ALL hospitals are not equipped to take care of industrial casualties. At the present time, a national study is being undertaken to determine which hospitals are qualified to take care of their type of case, and those which do not come up to minimal requirements and are interested in taking care of cases injured in industries will be informed of their shortcomings.

Twenty-four hour emergency service must be available with nurses present who have had basic training in traumatology. Blood, plasma, glucose, and saline must be available at a moment's notice. Balkan frames, Thomas splints, ropes, pulleys, weights, bed boards, and Bradford frames should be available in sufficient quantities to meet the current demands and should immediately be repaired or replaced when broken.

At least two key nurses should be available when needed. Of these one should be in charge of the operating room to assist with the equipment necessary for debridement of compound fractures, internal fixation of fractures, and repair of soft tissues. Unless one nurse is well-trained for this type of work in the operating room, the efficiency of this department becomes so low that it represents a hazard. The other nurse should be in charge of all the orthopedic equipment so that it is always in working order, well-oiled, with sufficient quantities available to meet the demands of the influx of these types of cases.

Blessed indeed is the institution which is so fortunate as to have a well-trained, intelligent, cooperative, and hard-working nursing staff.

Without a resident or a long-term intern, the efficiency of the postoperative care suffers. The monthly rotation of interns on a traumatic service is to be condemned, because the attending surgeon is forever training new assistants who, when they get to the stage of being an asset, are transferred to another service. A six-month or a year resident is ideal. The minor details which are time-consuming, yet important, are taken from the attending surgeon, who can use his time to better advantage. The patient receives much better postoperative care. Tractions are applied and continually adjusted. Casts are slit, the circulation of extremities is carefully watched, and the innumerable wants of the injured patient are readily and efficiently taken care of.

Of necessity, a large in-patient service will have a large out-patient service. Adequate rooms should be available to examine patients, change casts, remove stitches, and change dressings. Here again, the well-trained orthopedic nurse is priceless.

Rehabilitation

EVENTUALLY in all cases the question of rehabilitation becomes of paramount importance. The Surgeon's General Office, during the last war, did a marvelous job of rehabilitating the injured. The industries can well profit by copying the principles used by the army.

Physical rehabilitation can best be done by qualified physical therapists. This is a distinct branch of physical medicine and requires special training. All too frequently physical therapy consists in turning on a heat lamp and coming back in half an hour to turn it off. This type of treatment is, in many instances, a sham. The application of heat massage, graduated exercises, active and passive joint motions, and muscle reeducation requires skill and takes time. The ultimate specific disability can be markedly lowered by a good physical therapy department in any hospital. The attending surgeon must work with the physical therapist in order to obtain the maximum results.

Occupational therapy is a valuable adjunct to rehabilitation but, unfortunately, is not practical unless a large number of casualties are available for treatment. However, in actual practice only a relatively small percentage of cases require occupational therapy.

Diversional therapy for patients who require prolonged hospitalization is most important in order to keep up the patient's morale. Many

bedside tasks and forms of handicraft can be undertaken to help the patient pass the time. Corrective therapy is very important in the rehabilitation of fingers, arms, and legs. It teaches the patient coordination of muscles, improves the range of motion of the articulations, and teaches the patient how to use his impaired member. If at all possible, the occupational therapist should know the patient's former occupation and make every effort to give him tasks to perform that are similar to his regular job. Should the disability be such as to prevent him from returning to his regular job. Should the disability be such as to prevent him from returning to his former work, the therapist should try to guide the patient so that he will be better prepared for a new job of his own selection.

Job Reclassification

WHEN the patient has reached the maximum medical improvement and is discharged from further medical care, every effort should then be made to return him to his former work. However, if an individual is unable to perform this work satisfactorily because of his newly acquired disability, a job reclassification should then be attempted. This should be done by one well-versed in this type of work.

An individual who has a disabled hand should be placed in a job that does not require skilled hand work and one in which the legs and other arm can be used. If he has an adequate background, he should be given a desk job or clerical work. An individual who has a leg disability should preferably be given a bench job or a machine job where he can sit most of the day and use his hands.

The correct job classification is a most important stage in an injured man's life. A patient's livelihood, morale, general outlook on life, and the happiness of his family depend on his getting back to a job where he can be gainfully employed, and happily so, for the rest of his natural life. Since this world is not a Utopia, this is not possible in all cases, but by a concerted effort on the part of the patient, doctor, and employer, a happy ending can be reached in most instances.

Conclusions

THE prime purpose of everyone associated with an injured employee should be a desire to get him well as quickly as possible and with the minimal amount of disability.

2. Competent surgical care should be given to every seriously injured patient.

3. Nothing is so expensive as incompetent surgical care, from the standpoint of pain, suffering, financial expense, or final disability.

4. A moral obligation exists with the insurance company to see that the patient gets the best treatment that is available, and that he continues getting it until the maximum possible improvement is reached. Dollars and cents never adequately compensate for a disability and loss of earning power for the rest of a patient's life.

5. The patient also has an obligation to pay. He must at all times cooperate and help himself get well. A patient who is willing to stand pain in order to get more motion in a finger, arm, or leg is certainly going to get a better end result than the one who sits back and says, "Well, someone else is paying the bills so why should I worry."

Sickness and Accidents

INDUSTRIAL medicine is making great strides, but the fact remains that thousands of plants are without a medical director, or even a nurse. Some communities are attacking the problem through local foundations and clinics, with the cost underwritten by participating employers. In others, local hospitals are adding industrial health departments, often with the encouragement and sponsorship of the chamber of commerce or the manufacturers' association. In addition, both state and Federal governments are paying increased attention to the need for reducing illnessess and accidents due to work hazards. Trade associations are also giving greater heed to these problems. A plant-wide health and safety committee, made up of employees representing various departments, is a proved device for eliminating hazards, as well as for keeping check on plant housekeeping, lighting, ventilation and other working conditions. Awards for excellence help to keep interest at a peak, especially if well publicized in the employee publication and the local press. Into such a program additional devices like voluntary health examinations, cold prevention programs and other activities dovetail without the resistance which might otherwise be encountered. Caution: ALWAYS offer health tests, injections and similar projects on a purely voluntary basis.

—From "Reduction of Hidden Labor Costs," by O. C. COOL, Director, Labor Relations Institute, in *Lingerie Merchandising*, September, 1948.

Dermatological Hazards in the Leather Industry

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IN OUR investigations of the skin hazards of the commodity goods industries of the Philadelphia industrial center, we recognized the overlapping of entirely different industries by virtue of the employment of men and women represented by a single labor union. Instead of reviewing these industries separately it was deemed advisable to consider these industries as a unit as represented by such a labor unit. This will explain the mention of wool-pullers and felt and hair workers in this report purporting to describe the skin hazards of the leather industry. Such an arrangement of our material was also considered advisable when we discussed this problem with some of the representatives of labor of this industry. Examination of several plants was made available to us through the cooperation of the Philadelphia Chamber of Commerce.

There are approximately 3000 men and women employed in the Philadelphia area who are members of the International Fur and Leather Workers Union, C.I.O. These are in four different industries: belting, wool-pulling, felt and hair manufacturing, and tanning. The employee breakdown numerically of these industries was as follows: (1) tanning 2225; (2) wool-pulling, 400; (3) belting, 200; (4) felt and hair, 175. There were no labor union statistics separating negro from white employees. The number of women in this group was 400.

The purpose of this study is to describe the working environment, the skin hazards encountered, the agents responsible for the dermatological conditions, and the incidence of dermatitis from available statistics.

Leather Tanning

THREE tanning plants were examined. One was a large plant restricted to the tanning of kid where we were able to follow the transformation of the goat skins to glazed kid, a leather that is used in more women's shoes than any other leather. This plant employed about 750 men and women. Hides and skins from cattle, calves and sheep were tanned in the other two plants. The larger one employed 450-500 workers and handled about 50,000 skins per week. Approximately 40 men were employed in the smaller plant. These plants as a group afforded a fine cross-section of the physical facilities of the tanning industry. Striking differences of the working environment ranged from a poorly ventilated basement, where washing facilities for the employee was limited to several oaken buckets, to well ventilated work rooms with brick flooring allowing for frequent piping and ample drainage—and an arrangement of locker and shower rooms which forced the employee to take a shower before changing into his street clothes. No special soaps were supplied by any of the plants. One firm supplied a solution of potassium permanganate for decolorization for those handling pigments. The use of protective clothing was prevalent in the large plants and inadequate in the small shop. An adequately equipped dispensary with the services of a part-time physician and a full-time nurse was maintained by one tannery. A first-aid room was available in another plant.

Although the process of tanning varies somewhat from plant to plant, depending upon secret formulae perfected, the basic principles of tanning were observed. These are being reviewed, for then one is enabled to appreciate the chemicals and hazards encountered as a lot of skins (from goats, kids and sheep) and hides (from bulls and cows) are followed through to the very end of the various processes which are used to transform them into the forms of leather which are familiar to everyone. None of the obsolete methods of "vegetable" tanning was in use in the plants surveyed. Such leather, incidentally, was rather hard and uncomfortable. It is therefore only the chrome method of tanning which follows.

Twenty-five per cent of the black glazed kid made in this country was the output of the kid tannery surveyed. All these skins were imported from the various continents of the world. The other two tanneries handled both foreign and domestic products. The skins and hides arrive at the plants in bales of various sizes. These may be flint-dried (sun cured) or cured with salt or earth. The purpose of curing is to arrest bacterial destruction of the animal skin. Prior to tanning, it is necessary to soften the skins and hides and remove their hair and flesh. This involves processes known to the industry as soaking, liming, unhairing, fleshing, bating or puering, and pickling.

Commencement of these preliminary measures takes place in the "beam house," a name retained from old times when skins were "broken" by hand across large beams. First the skins were soaked in vats of water, a procedure requiring 24 to 72 hours. From the "soaking vats" the hides are transferred to large cylinderical drums where they are milled until soft. This milling requires one-half hour to four hours and its pur-

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This is the fourth of a series of papers reviewing in the dermatological field, the hazards encountered in the Commodity Goods Industries of the Philadelphia Industrial Center. These papers are incorporated as part of the lecture course in "Industrial Dermatitis" given to the post-graduate students in dermatology at the Graduate School of Medicine, University of Pennsylvania, Department of Dermatology, DR. DONALD M. PILLSBURY, Director.

pose is to make the skins thoroughly pliable so that they approximate the condition of freshly flayed skins. The skins are then taken to the trimmers. These men, using large razor-sharp knives, skillfully trim off superfluous appendages as ears, horns, hoofs and ragged edges. This group of workers wear rubber aprons to prevent contact with the wet skins.

It is only in these departments where the handling of the raw hides and soaking takes place, that instances of anthrax occur.

Liming follows. Its purpose is to loosen the epidermis and swell the corium so as to allow for depilation. Liming also clears the skin of undesired fatty and waxy matter. By the old method called "pit liming," the skins were immersed in a vat containing a lime solution and were removed and replaced daily by hand for two weeks. In contrast to this slow and laborious method are wooden liming drums, slowly rotating at regular intervals for four to five days. The solutions used are dehydrated lime, sodium sulfide and other chemicals—depending upon the formulas perfected by the various tanneries. The men carrying out this task wear rubber gloves, boots and aprons as protection against the lime solution. (The pH of the solution is about 12.)

From the liming drums, the skins are removed for unhairing. This is a mechanical process where the hair is removed from the freshly limed skins by the action of close-paired rotary knives. These workers wear rubber gloves and gauntlets to prevent irritation from contact of the lime solution. Occasionally the lime solution may seep inside the gloves to produce a lime dermatitis. The skins are then washed in paddles to remove the excess lime.

In "fleshing," all excess flesh and fat are cleared away thereby producing a skin that will soak up puering and tanning chemicals thoroughly and evenly. This procedure is mechanical and the machines with guards are arranged in pairs. As the skin comes out from under the revolving knives the muscle, fat and all loose tissue from the underside of the skin are removed. The workers at this job are protected with rubber gloves, sleeves, aprons and boots.

The purpose of the next operation is to neutralize the lime in the skins. The name given to this procedure is puering or bating. The skins swollen by the lime return to their original thickness, become soft and have a fine, silky feel as a result of this chemical process. This is accomplished by putting the skins in puering reels, tubs containing the bating solution which is an enzyme compound derived from animal pancreas. A pH of 7.5 to 8 is reached at the finish of this puering process. The hides are then pickled in vats containing sodium chloride and a 1% to 2% solution of sulfuric acid. There were no reported instances of acid burns in the men of the pickling department.

The skins and hides are now ready for their conversion to leather by tanning. The solutions used in chrome tanning vary, depending on the type of skin and the product desired. The purpose of the tanning process is to protect the skins from the influence of outside elements by depositing a metallic (chrome) coating around the collagen fibres of the corium. The fixing process makes this coating more permanent and more resistant.

The "two bath" process was observed. The skins are milled in vats (the chrome bath) consisting of sodium bichromate and hydrochloric acid. When the skins are removed from the chrome bath, they are light yellow, dripping wet, and saturated with chromic oxide. The excess liquid is "struck out" by running the skins between rollers under slight pressure. The skins are then put into a second bath consisting of a solution of sodium thiosulfate and hydrochloric acid to which sodium bicarbonate is later added.

In this "fixing" bath, the chrome is combined in a chemical compound (chromic hydroxide) which results in a firm collagen chromate complex that will stay unchanged in the leather. In this procedure while handling the skins saturated with chromic acid that cases of dermatitis occur. Workers, usually the younger ones or those not wearing protective garments, are subject to chrome ulcers or chrome "bites" and "holes," in the tanners' vernacular. The skins come out of this bath a light blue in color. Excess chemicals are "struck out" by wringing out the excess moisture from the hides.

The skins are then sorted for the shaving department. The shavers handle clean skins which have been neutralized. No instances of dermatitis have been reported among this group of employees. The purpose of this procedure is to "even up" the skins to a uniform thickness. The skins now tanned and shaved into uniform thickness enter the coloring room. A definite weight of skins is agitated in a revolving drum with a definite amount of pigment solution previously prepared in the pigment room. Only one case of sensitization to dyes was observed. The skins are then "fat-liquored" in drums containing emulsions of sulfonated oils as neats foot or cod liver, and glycerine. This step impregnates the skins with fatty materials previously removed in the pre-tanning procedures.

The skins which are now leather are prepared for further conditioning. The skins are dried by hanging in the air-drying enclosures or by passage through tunnel dryers on conveyor belts. In this dry atmosphere, the water is evaporated. The skins become stiff from the air drying and are dampened by stacking in piles having alternate layers of damp sawdust and skins. The purpose of this dampening is to give the leather a soft, mellow feel. There were no repeated cases of dermatitis in this latter department, however, instances of miliaria were reported in workers in the air-drying lofts.

The leather is now prepared for "staking," a mechanical process to "break" the stiffness and make the leather more pliable. The workers performing at these machines are easily recog-

nized by the knuckle pads of their hands. These thickened and lichenified pads are the result of friction produced when the leather is being pulled down, over, back and forth, in the staking operation.

Buffing is the next operation. The leather is worked over by rotating wheels impregnated with a fine abrasive, thus brushing the outer grain side of the leather.

The leather is now prepared for finishing, an operation performed both by machine and hand. Various preparations consisting of albuminous material impregnated with resins, waxes and dyes, make up the fixing solutions. These substances, which bring the leather to a deep, rich black, may be responsible for instances of eczematous dermatitis due to sensitization. The leather is then dried either in drying tunnels or in hot-air chambers. The glazing base may also be applied with soft brushes by men or women wearing rubber gloves.

A mechanical burnishing process which produces the desired quality of luster in the leather is the next operation. This is the process of glazing where solid frosted glass cylinders hammer down and slide over the skin as it is held on a leather strap by the worker. No cases of dermatitis were observed in the glazing departments of the tanneries inspected.

For certain skins, ironing and plating are the final steps necessary for the final appearance to the leather. The skins are then sorted, graded, weighed and stored.

The knowledge of these mechanical and manual operations, of the chemicals and biologicals used in leather tanning and the facilities supplied for cleansing are the important clues required in detecting the hazards responsible for dermatitides in this industry. When this information is integrated with the causative agents of an industrial dermatitis—mechanical, physical, biological, and chemical—then a schematic presentation of dermatitis in the leather tanning industry can be tabulated. The following outline is offered as a guide:

A. Mechanical Causes: Friction—Pressure: producing knuckle pads—staking department.

B. Physical Agents: Heat: miliaria—workers in the dry loft.

C. Biological Agents. Bacterial (B. anthracis) —anthrax—beam house workers at the soaking vats and trimmers.

D. Chemical Agents: 1. Inorganic: *Acids*: (a) Chromic acid—chrome ulcers—employees working with the fixing bath; (b) sulfuric and hydrochloric acid—acid burns—pickling department. *Alkalies*: (a) Lime—eczematous dermatitis—liming and fleshing departments. The action of these chemicals is that of primary irritancy.

2. Organic: (a) Dyes—eczematous dermatitis —dyeing and finishing department. The action of these chemicals is that of epidermal sensitization. (b) Soaps (organic and inorganic chemicals)—eczematous dermatitis—used by workers for cleansing. The action is that of a primary irritant.

PREVENTIVE measures that may be instituted: 1. Mechanical agents—to prevent the knuckle callosities, workers can protect these pressure points with adhesive strippings or with leather gloves.

2. Physical agents: modern plants overcome the "turkish bath" atmosphere of these hot air lofts by converting to tunnel dryers.

3. Biological agents: (a) Use of impermeable aprons and rubber boots for the soakers and trimmers. (b) Thorough cleansing of work benches. Thorough frequent cleansing of exposed parts of body. (c) Immediate reporting of any infection or laceration occurring in the soakers and trimmers.

4. Chemical agents: (a) Wearing of protective gloves. (b) Immediate washing of infected parts following contact with the acids and alkalies. (c) Removal of workers from finishing or dyeing department if subject to dye sensitization. (d) Use of non-abrasive and low pH types of cleansers.

Clauses pertaining to the safety and health of the employees are incorporated in the working agreements between management and the union. Contracts call for the employer to supply rubber boots, where the work requirements demand, to regular employees working in the wet departments. Aprons, gloves and other protective devices are specified. One of the firms provided the employees with towels and soap.

In that plant which supplied dispensary facilities, a part-time physician and a full-time nurse, there were no statistical records relating to the incidence of dermatitis. It was the impression of the medical staff that the majority of the dermatitis cases resulted from poor cleansing procedures carried out by the workers. This plant, incidentally, provided the best facilities and arrangement for showering and washing. There were no medical records in the other two plants surveyed.

The incidences of dermatitis in the tanning department will be reviewed in the statistical report of the leather industry in a subsequent paper.

SUMMARY: (1) A description of leather tanning is presented. (2) A schematic outline reviews the causative agents responsible for dermatitides and the types of eruptions prone to occur in this industry. (3) An outline of preventive measures is tabulated.

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Dental Medicine

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THE FOLLOWING is a synopsis of an address given before the Greater Philadelphia Annual Meeting of the Philadelphia County Dental Society, February 5, 1948.

DENTAL FOCI IN POSSIBLE ETIOLOGICAL RELATIONSHIP TO CONDITIONS AND DISEASES DUE TO FOCAL INFECTION: (1) Chronic gingivitis due to infection; (2) pus pockets of periodontitis; (3) vital but infected pulps; (4) non-vital infected pulps; (5) apical infections and cysts from necrotic pulps and improperly treated and filled root canals; (6) infected retained root tips; (7) residual infections after extractions; (8) impacted or partially erupted infected teeth; (9) infected radiculo-dental, dentigerous or multilocular cysts; (10) salivary calculi with infections, and (11) chronic osteomyelitis of the jaws.

CONDITIONS POTENTIALLY DUE TO DENTAL FOCAL INFECTIONS: (1) General debility; (2) fatigue; (3) anorexia; (4) loss of weight; (5) excessive drowsiness; (6) headaches; (7) hypochromic normocytic anemia; (8) acquired hypotension; (9) reduced immunological resistance.

DISEASES POTENTIALLY DUE TO DENTAL FOCAL INFECTIONS: (1) The infectious arthritides; (2) rheumatoid or atrophic arthritis; (3) fibromyositis and bursitis; (4) neuritis; (5) subacute bacterial endocarditis; (6) iritis and other infections of the eyes; (7) pyelonephritis and other infections of the kidneys; (8) cholecystitis; (9) phlebitis and thrombophlebitis; (10) erythrma nodosum and (11) some cardiac arhythmias.

DENTAL ASPECTS OF RHEUMATOID ARTHRITIS: (1) Embraces about two-thirds of all chronic arthritides; (2) most common in young adults and occurs about twice as frequently in females as males; (3) emotional strain, overwork, trauma, exposure and heredity may be predisposing causes; (4) streptococcal infection secondary to focal infections probably an exciting cause; (5) involvement of the temporomandibular joints not uncommon; (6) undernourished and weakened individuals should be prepared for extractions by medical measures; (7) exacerbations may follow extractions; (8) only one or two teeth should be removed at first; (9) subsequent teeth may be removed at weekly intervals; (10) prompt improvement may occur in early cases; (11) general improvement in chronic cases.

COMMON CAUSES OF CHRONIC HEART DISEASE: (1) Rheumatic fever; (2) hypertension; (3) coronary artery sclerosis with or without myocardial infarction due to occlusion; (4) syphilis; (5) congenital defects and (6) hyperthyroidism. Congenital defects are the most common causes in infancy, rheumatic fever in older children and young adults, and in later life hypertension, coronary sclerosis, syphilis or hyperthyroidism.

DENTAL ASPECTS OF RHEUMATOID HEART DISEASE: (1) Constitutes about 40% of all heart disease and over 90% of all cases in children and young adults; (2) more than half give a history of rheumatic fever or chorea; (3) etiology unknown but may be due to hemolytic streptococci of group A; (4) disposition to recurrence is characteristic and especially through tonsillar infections; (5) mitral valves involved in 62%, aortic valves in 5%, and the two together in 33%; (6) ultimately usually results in congestive heart failure; (7) the scarred valves predispose to secondary subacute bacterial endocarditis; (8) consequently all cases of rheumatic heart disease especially require periodical dental care for the detection and elimination of dental infections.

DENTAL ASPECTS OF SUBACUTE BACTERIAL ENDOCARDITIS: (1) Rarely occurs in normal individuals; (2) usually occurs in cases of chronic valvular and congenital heart disease; (3) usually due to infection with streptococcus viridans during periods of bacteremia; (4) many cases due to focal infection of dental origin with special reference to periodontitis and poor oral hygiene; (5) sometimes follows the extraction of infected teeth; (6) all individuals with chronic valvular and congenital heart disease should be kept as free as possible of dental infections; (7) when extractions are required all possible preparatory prophylactic measures against bacteremia should be taken; (8) local anesthesia is preferred and not more than one or two teeth should be extracted at a time; (9) chemoprophylaxis is also advisable; (10) for this purpose an intramuscular injection of 300,000 to 600,000 units of procaine penicillin may be given the days of extraction and two or three days thereafter.

DENTAL ASPECTS OF PRIMARY OR ESSENTIAL HYPERTENSION: (1) At rest the normal *systolic* pressure varies from 130 to 140 mm. in middle life, and between 140 and 150 mm. after the 60th year; (2) in women the average is from 5 to 10 mm. lower than in men; (3) the normal *diastolic* pressure in adults varies from 70 to 100 mm.; (4) hypertension may exist for years without signs and eymptoms; (5) about 60% of cases ultimately die of congestive heart failure, about 20% of apoplexy and 10% of uremia; (6) coron-

ary sclerosis may occur; (7) pain, fear and nervousness should be avoided as much as possible; (8) extractions are fairly safe but the dentists should consult the patient's physician as adequate premedication may be advisable; (9) in local anesthesias a minimum amount of epinephrin should be used which may be omitted in many cases; (10) nitrous oxide anesthesia may produce elevation of blood pressure even when mild asphyxial states are avoided.

DENTAL ASPECTS OF CORONARY SCLEROSIS AND MYOCARDIAL INFARCTION (1) Coronary sclerosis is due to arteriosclerosis (atheroma) or to chronic hypertension; (2) it is an irreversible and progressive degenerative disease related to disorders of cholesterol metabolism; (3) it is frequently mistaken for "indigestion"; (4) it usually produces substernal discomfort or angina pectoris; (5) the pain is sometimes referred to the teeth and jaws; (6) myocardial infarction is usually due to coronary thrombosis and sometimes to coronary embolism; (7) sudden death may occur; (8) recurrent attacks are frequent; (9) all dental treatment is contra-indicated in coronary sclerosis until the patient's physician has been consulted for cooperative management; (10) fear, nervousness and pain from any cause should be avoided; (11) all dental treatment is contra-indicated during the acute stage of myocardial infarction; (12) during convalescence only the most conservative treatment is permissible; (13) following recovery, the risks of usual dental treatment are slight but nevertheless real; (14) procaine without epinephrin is the anesthetic of choice; (15) otherwise one-half unit of surgical pituitrin may be used with two cc. of procaine (anesthesia lasts about 35 minutes); (16) anginal attacks in the dental chair may be relieved by placing a 1/100 grain tablet of nitroglycerine under the tongue.

BLOOD DYSCRASIAS WHICH MAY PRODUCE ORAL MANIFESTATIONS: (1) Hypochromic normocytic anemia; (2) pernicious anemia; (3) the Plummer-Vinson syndrome; (4) the aplastic anemias; (5) Cooley's anemia; (6) the polycythemias; (7) agranulocytosis or malignant neutropenia; (8) the leukemias; (9) purpura hemorrhagica; (10) hemophilia and (11) hereditary hemorrhagic telangiectasis.

THE DENTAL ASPECTS OF AGRANULOCYTOSIS: (1) A syndrome characterized by severe leukopenia due to an absolute reduction in the granulocytes (neutrophils, eosinophils and basophils) of the blood; (2) may be primary and of unknown etiology; (3) usually secondary due to the toxic effects of amidopyrine, barbiturates, sulfonamides, organic arsenicals, gold salts, etc., upon the bone marrow; (4) occurs most frequently in women; (5) rare in Negroes; (6) in most cases produces malodorous, dirty, gray necrotic areas in the oral cavity or throat (agranulocytic angina) with secondary Vincent's infections; (7) patients not infrequently first consult dentists; (8) diagnosis greatly aided by total and differential leucocyte counts; (9) penicillin highly effective in treatment.

DENTAL ASPECTS OF THE LEUKEMIAS: (1) Characterized by an overgrowth of the leukoblastic tissues of the body with an enormous increase in the leukocytes of the blood; (2) may be acute or chronic and, depending upon the leukoblastic tissue involved, are divided into (a) myelogenous, (b) lymphogenous and (c) monocytic; (3) etiology unknown; (4) invariably fatal; (5) oral manifestations particularly likely to occur in the acute leukemias; (6) consequently, patients may first consult dentists; (7) marked gingivitis with ulceration and bleeding especially in the maxillary molar and lower anterior regions; (8) all other soft dental tissues may be involved as, likewise, the buccal mucosa and throat; (9) odontalgia may occur without apparent clinical cause; (10) secondary Vincent's infections commonly occur; (11) total and differential leucocyte counts essential for diagnosis.

ETIOLOGY OF PURPURA HEMORRHAGICA: (1) Thrombocytopenic, due to a numerical decrease of platelets, which may be (a) primary or idiopathic of unknown etiology, and (b) secondary, due to infections, toxic agents, tumors, etc., affecting the bone marrow; (2) non-thrombocytopenic, which may be due to (a) thrombasthenia, (b) hypoprothrombinemia or (c) increased capillary fragility which may be primary or secondary resulting from a deficiency of vitamin C or nicotinic acid, allergy, acute and chronic infections, cardiorenal disease, poisons, drugs, etc.

DENTAL ASPECTS OF PURPURA HEMORRHAGICA: (1) May produce such oral manifestations as gingival bleeding, petechiae of the oral mucosa and particularly at the junction of the hard and soft palates, spontaneous pulpal hemorrhages; etc.; (2) the diet should be soft to minimize trauma; (3) if possible the cause should be discovered and removed; (4) extractions should not be attempted unless absolutely necessary; (5) in this case one or more small blood transfusions should be given preoperatively in thrombocytopenic purpura; (6) or 1-2 mg. of vitamin K with 1-2 gms. bile salts orally three times a day if due to hypoprothrombinea; (7) or 0.25 gm. of vitamin K (citrin) orally every two hours if due to increased capillary fragility, vitamin C, or niacin (nicotinic acid amide), etc.

DENTAL ASPECTS OF HEMOPHILIA: (1) A hereditary hemorrhagic disease which is manifested clinically in the male and characterized by a tendency to intractable hemorrhage following trauma or occurring spontaneously; (2) transmitted only by the female as a recessive sex-linked characteristic who, except in extremely rare instances, presents no clinical manifestations of the disease; (3) characterized by prolongation

of the coagulation time of the blood; (4) usually first recognized in early childhood; (5) sometimes the first evidence is hemorrhage during the eruption of a tooth or excessive bleeding following an extraction; (6) marked gingival bleeding may be associated with an abscessed tooth; (7) extraction is in many respects a major surgical operation; (8) the patient should be hospitalized and given small transfusions every 12 to 24 hours until the coagulation time is approximately normal before extraction.

PULMONARY FOREIGN BODIES OF DENTAL ORIGIN: (1) Extracted teeth or fragments, inlays, crowns, pieces of amalgam, inlay waxes, small root canal instruments, etc., accidentally inhaled during dental operations, or (2) partial dentures inhaled during sleep; (3) extractions under general anesthesia with no or inadequate throat packs may be responsible; (3) likewise, extractions or other operations under bilateral mandibular anesthesia resulting in abolishment of the pharyngeal reflexes; (4) small objects may produce few or no symptoms and escape detection unless discovered by x-ray examination; (5) otherwise, sudden violent coughing with asphyxia and cyanosis usually occur; (6) unless removed by bronchoscopic methods, lung abscess may occur due to infection.

DENTAL ASPECTS OF JAUNDICE: (1) May be *obstructive* due to blocking of the bile ducts by gallstones, inspissated bile, mucus, parasites, tumors, cysts, strictures, adhesions, kinking, etc., (2) *hepatic,* due to infectious hepatitis, Weil's disease, toxic agents or acute yellow atrophy, cirrhosis, carcinoma, abscess, etc., of the liver, or (3) *hemolytic,* due to familial hemolytic anemia, malaria and other infections, pernicious anemia, incompatible blood transfusions, hemolytic anemias due to toxic drugs and poisons, etc.; (4) all jaundiced patients may bleed excessively after extractions or other surgical procedures; (5) if required the patient should receive vitamin K with bile salts before and after operation.

ALLERGY IN RELATION TO DENTISTRY: May be due (1) to drugs like procaine, sodium perborate, chloroform, camphophenique, sulfonamides, dilantin, barbiturates, antipyrin, salicylates, aspirin, quinine, etc.; (2) to chemical agents and other materials like iodine and formalin compounds, aromatic oils, metallic denture bases, vulcanite, metallic alloys and amalgams, acrylic and plastic materials, etc., or (3) to substances used by patients like dentifrices, mouth washes, lip sticks, chewing gum, etc.; (4) etiological diagnosis is made by a thorough history, physical examinations and skin tests; (5) treatment requires strict elimination or avoidance of the allergen whenever possible, desensitization if possible, and the administration of epinephrin, ephredrine, benadryl or pyribenzamine for symptomatic relief.

DENTAL ASPECTS OF DIABETES MELLITUS: These may embrace (1) dryness of the mouth, sweetish saliva and sometimes an acetone odor of the breath; (2) glossitis; (3) gingivitis and (4) increased tendency to periodontitis, decalcification of the alveolar processes, caries and pulpitis; (5) dental infections tend to reduce ability to metabolize carbohydrates with aggravation of the disease; (6) consequently, the mouth should be kept in the best possible hygienic state with frequent and regular dental care; (7) caustic compounds should not be employed; (8) teeth with pronounced suppurative areas should be extracted; (9) adequate pre-medical care should precede dental surgery which should be as atraumatic as possible; (10) local anesthesia with .75% monocaine without epinephrine is preferred; (11) extensive infections and necrosis following extractions may be the first evidence of the disease; (12) dry sockets occur more frequently than in normal individuals; (13) protracted bleeding may be due to vitamin deficiency.

THE DENTAL ASPECTS OF ACQUIRED SYPHILIS: (1) The most frequent extragenital lesion is chancre of the lip; (2) chancres may also occur on the tongue, gingivae (rarely) and tonsils; (3) chancres of the fingers (especially left hand) are not uncommon in dentists and technicians, due to accidental infections; (4) mucous patches and relapsing mucosal lesions commonly occur in the oral cavity; (5) chancres, mucous patches and relapsing mucosal lesions are highly infectious; (6) only essential dental work should be done during the primary, secondary and early relapsing stages of the disease; (7) dentists and technicians should wear rubber gloves, carefully avoid needle pricks and other injuries, and sterilize all instruments after use; (8) the diagnosis of chancres of the lips and fingers is primarily by darkfield examinations for *T. pallidum;* (9) darkfield examinations are of lesser value in the diagnosis for intra-oral lesions because *T. pallidum* cannot be reliably differentiated from *T. microdentium* of the saliva; (10) in chronic syphilis (latent and tertiary stages) there is little or no danger of accidental infection; (11) the diagnosis of latent syphilis can be made only on the basis of a positive history or positive serologic reactions; (12) a negative history and negative serologic reactions do not exclude the possibility of syphilis; (13) respectability alone is no bar to the penetrability of *T. pallidum;* (14) the most frequent tertiary lesions are leukoplakia, gumma of the lip, gumma of the tongue and sclerosing glossitis, gumma of the hard and soft palate with or without perforation, and osteomyelitis of the hard palate and mandible; (15) leukoplakia should always arouse suspicion of syphilis; (16) siderosis of the gingivae or buccal mucosa commonly occurs during treatment with bismuth or mercury; and (17) elimination of oral foci of infection and maintenance of optimum oral hygiene are important.

First Argentine Congress of Industrial Medicine
—Conclusions, Votes and Recommendations—
Buenos Aires, May 27, 1948

Section I.—Human Industry

THE CONGRESS considers:

That industrial medicine is a scientific discipline of profound social importance, which studies the problems associated with the health, hygiene, security and well-being of the worker, providing solutions which result in increased production and promote the moral and material elevation of society.

That the public powers should support the projects which contribute to scientific progress and the practical applications of which redound to the benefit of the community.

That the work which the specialists of all the American countries are doing at present does not reach its objectives and does not receive the dissemination which its value entitles it to have because of the lack of coordination and of interchange of information, studies and experiences.

That the creation of the AMERICAN UNION OF INDUSTRIAL MEDICINE, sanctioned by the unanimous vote of the members of the Congress who are present, fulfills this need.

That its exclusively scientific character will permit the AMERICAN UNION OF INDUSTRIAL MEDICINE to offer its disinterested advice, free from any influence except its medical character, to the governments, official and private bodies and professional and particular groups which ask for it.

THE CONGRESS considers:

That despite mechanization, industry remains dependent on the human factor, which conceives, constructs, installs and manages the machine.

That the human organism is more difficult to maintain in a perfect state of production than the most delicate machine.

That in every factory or shop, associated with the engineer who is responsible for production, there should be a physician watching over the more sensitive mechanism: the human brain and body.

Section II.—Physiology of Human Industry

THE CONGRESS, considering the importance of investigations on the physiology of human industry, not only in its own field, but also in recreational medicine, aeronautic medicine, etc., and its practical applications in increasing production in diverse conditions of climate, humidity, temperature, altitude, velocity, etc., in contributing to the physical education of the community and to the needs of national defense, RECOMMENDS: The creation of an INSTITUTE OF INDUSTRIAL PHYSIOLOGY with a triple function: investigation, teaching and advice. The Institute of Industrial Physiology will act conjointly with the INSTITUTE OF INDUSTRIAL MEDICINE to be created in the faculties of medical sciences.

Section III.—Nutrition of the Workers

THE CONGRESS, considering the extreme importance which the nutrition of the community of workers has for the life, health and future of coming generations, approves the following: VOTES: (1) It is fitting that the government assist families whose proper nutrition consumes 50% of its income. (2) Every business or industry which employs a considerable number of women should establish a "Cradle Room" and a kindergarten for the care and oversight of the children of these women. (3) Every business or industry that employs more than 250 persons should offer them the use of a dining room. (4) The dining rooms of industries, commercial houses and institutions should be under the direct control of the state and should be directed by physicians trained in dietetics and dietitians certified by the schools of the nation. (5) The state, with the aid of technical specialists, should conduct periodic investigations throughout the country to determine the nutrition of the community of workers and the causes of its probable deterioration. These investigations should have a biologic, economic and social orientation. (6) The state should maintain instruction throughout the country in family nutrition and the economic means to realize it.

Section IV.—Professional Intoxications

DESPITE the fact that professional intoxications do not present the serious problem today that they once did, the Congress RECOMMENDS: That the means tending to avert the appearance of these intoxications should not be neglected, and that there be intensification of studies intended to disclose them early, particularly when new industries are concerned or industries in which chemicals or substances suspected to be injurious to health are handled.

Section V.—Professional Selection and Orientation

THE CONGRESS declares:

That professional selection and orientation, carried out by scientific methods, contributes to the prevention of industrial accidents and diseases, facilitates the rehabilitation of the injured, improves production and shortens the training period.

That, for better understanding of the antecedents which facilitate psychologic diagnoses for professional orientation, observations should be made and documented during the primary instruction, proceeding according to special methods.

Approved, May 27, 1948, Buenos Aires. Translated from *Medicina del Deporte y del Trabajo*, June, 1948.

Section VI.—Medical Assistance

THE CONGRESS, considering that industrial accidents, because of their frequency, the severity of the lesions and the amount and importance of the residual incapacity, present a very serious problem which must be faced simultaneously from the medical, economic and social points of view, in order to perfect these, and the standing legislation and the system of lending medical assistance, as well as the essential aspect of the readaptation and rehabilitation of victims of accidents: ADVISES: (1) the creation of Integral Assistance Institutes for injured workers, with affiliated Centers of Re-Education and Rehabilitation; (2) the study of the system of insuring workers by the state or any other system which contributes to increasing the medico-surgical assistance which is actually provided to injured workers; (3) the adoption of means tending to assure, in public distributions and private industry, an appropriate place with fair pay to the readapted and rehabilitated patients coming out from these centers; (4) the completion of an intense and sustained educational campaign to convince industrialists of the advantages of accident prevention and workers of the fact that physical integrity and health are much more valuable than any sort of indemnity or invalids' pension.

Section VII.—Prevention of Accidents and Illnesses

THE CONGRESS recommends: (1) Establishment of the legal obligation of the employer to provide the means of personal protection for the workers and the legal obligation of the latter to use them during work. (2) That the masters and professors of "shop practice" in the workers' universities, trade schools and analogous institutions learn the means of preventing professional accidents and illnesses in order to teach them efficiently to their students.

Section VIII.—Labor Legislation

THE CONGRESS advises modification of the Law of Industrial Accidents No. 9688 and preparation of a "Codex of Industrial Hygiene and Security" as an integral part of the projected "National Sanitary Codex," taking into account both foreign and national experiences.

Free Subjects

THE CONGRESS considers the constitution of labor universities and similar schools a factor in social progress, well-being and education and recommends that in them be taught, in addition to technical and industrial subjects and related matters, the prevention of professional accidents and diseases.

THE CONGRESS recommends (1) to industrial concerns, official organizations, etc., that they facilitate and promote the specialization of their physicians in the various branches of industrial medicine. (2) To all countries affiliated with the AMERICAN UNION OF INDUSTRIAL MEDICINE that they work to make obligatory on general practitioners the reporting of professional illnesses to the corresponding organization. (3) To societies of industrial medicine and those devoted to combating tuberculosis that they unite in the study of the cause and effect relations between tuberculosis and industry.

THE CONGRESS, considering the importance of the problem of absenteeism, its effect on the production and the economy of the country, RECOMMENDS the appointment of a mixed commission made up of specialists in the various fields—medical, economic and social—to make a complete and thorough study of the subject.

THE CONGRESS recommends (1) application of a "Law of Illness Security" when the "Integral Social Security Law" cannot be applied; (2) in the special case of persons with heart diseases, appointment of a commission to deal with means of removing the obstacles preventing the entrance of re-educated cardiac patients into industrial employment; (3) admission of persons with compensated cardiac conditions into positions which their physical conditions permit them to fill.

Creation of Institutes of Industrial Medicine

THE CONGRESS, considering the practical importance and the economic and social significance of industrial medicine, the industrial development of the country and the urgent necessity of having available physicians and auxiliary technical personnel thoroughly acquainted with the field to meet the increasing needs of the public agencies and private industry, RECOMMENDS TO THE PUBLIC AUTHORITIES, especially the university authorities, the creation (with emergency nature) in the medical faculties of INSTITUTES OF INDUSTRIAL MEDICINE, with complete authority to investigate, teach and counsel. In these Institutes the students will be taught the usual elements of the specialty; they will offer SPECIALIZATION COURSES FOR GRADUATES, special courses for technical experts in Industrial Security, Hygiene and Well-Being, and courses in the preparation of auxiliary technical personnel: industrial nurses, etc. The SPECIALIZATION COURSE FOR PHYSICIANS will last two years and will comprise theoretical and practical instruction in the following fields: industrial physiology, nutrition of the workers, industrial pathology (professional intoxications and diseases), professional psychotechnic and orientation, industrial legislation, industrial traumatology and rehabilitation of the injured. Degrees conferred in these Institutes will have official character.

THE CONGRESS recommends: (1) intensification of the instruction in the faculties of engineering regarding professional risks in order that machinery and the means of protection may be perfected; and (2) interesting the faculties of chemistry in the creation of "Laboratories of Industrial Toxicology" to work with the medical institutes in the solution of problems of this nature.

THE CONGRESS, considering that the atmosphere of petroleum refineries produces in the workers pathologic changes, manifested in hematologic, digestive and nervous alterations, ADVISES physicians and engineers in the refineries to intensify their studies for definitive conclusions.

THE CONGRESS recommends (1) the establishment in public and private organizations of a department similar to the "Correos y Telecomunicaciones" of this country, which arranges for employment of an indeterminate time or transfer to suitable climatic regions of patients with pulmonary affections who need the change; employment or transfer of employees when illness in the immediate family makes it necessary to prevent family disintegration; and likewise, arranges for employment or transfer of employees who need special medical care which can be had only in large urban center. (2) Creation of "Homes and Schools of Arts and Crafts" for children of both sexes and scholarships enabling them to continue their studies to age 18, for children of workers who have been killed or totally disabled in industrial accidents. (3) The creation of a "National Industrial Code," based on the maximal figures for disease, the periodic fluctuation of these figures, the unification of methods of determination and official certification for every means of protection. (4) Publication of the Spanish Translation of the "mother work" of industrial medicine, entitled "Dissertation on Diseases of Workers," written by Bernardino Ramazzini and published in the year 1701.

In-Plant Medical Services

DR. A. G. KAMMER, medical director of the Carbide and Carbon Chemicals Corporation, of South Charleston, West Virginia, spoke on "The Place of In-Plant Medical Services in an Industrial Health Program." His discussion included the control of occupational diseases and the services directed at general health improvement among the working forces, which he asserted are requisite components of a modern industrial health program. The activities of the medical director in an occupational disease control program in its preliminary stages are of four types. They are a study of the manfacturing process, a survey of the medical and safety literature pertaining to the materials involved, research if necessary, and the development of a plan to prevent exposure of workmen to possible injury. DR. KAMMER outlined a program of supervision which must go into effect with the manufacture of a new product. A medical director must keep informed of events at the production unit, and at the same time measure the effectiveness of the control program by clinical observations in the plant dispensary. In his opinion, the most direct and least complicated approach to finding cases of early injury is that which is based on careful evaluation by competent medical personnel of the histories and findings of all employees who report for any reason at the plant dispensary. A second approach to early case finding is based on the study of results produced by two of the usual activities of an industrial dispensary; complete physical examinations, usually made at yearly intervals, and partial examinations made with greater frequency. A final method, usually unsatisfactory when employed alone, consists of statistical treatment of running data developed for an employed group, such as frequency and severity rates of sick absenteeism by specific cause, death rates by cause, and rates by cause of apparently non-occupational visits to the plant dispensary. DR. KAMMER concluded with the comment that a program of improvement of the general health level of the plant's employees is usually an almost unavoidable adjunct to the occupational disease prevention program, and that the in-plant medical department is the natural focal point for an active program of applied preventive medicine.

—From "Industries in West Virginia Discuss Health Programs" in *Industrial Hygiene Newsletter*, September, 1948.

The Localization of Foreign Bodies by X-Ray

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MOST foreign bodies which penetrate deeply into tissue are glass or metal and are thus radio-opaque. Their presence may be proved and their position determined by x-ray. Several methods of x-ray and fluoroscopic localization have been devised. One of the simplest and easiest to use with ordinary x-ray equipment is that of double triangulation. By this method the depth of the foreign body below the skin surface can be measured. This knowledge, added to the two dimensional information of the usual antero-posterior and lateral views, gives sufficiently accurate localization to permit rapid direct surgical exposure. Fluoroscopy, with its disadvantages of poor light, limited exposure time, and danger of contamination, can usually be avoided at the time of operation. However, preoperative fluoroscopy is advisable in certain cases to determine whether or not the foreign body is embedded in tendon or other movable tissue. Failure to take this precaution may cause the bewildered surgeon to assume that the foreign body itself has moved within tissue. A foreign body rarely migrates very far unless actually contacted and thrust through the tissue with an instrument. Once actually contacted it is usually easily removable.

After the usual antero-posterior and lateral views have been studied, the part of the body containing the foreign body is placed on the x-ray table in the position in which it will be placed at operation. This usually will be with the wound of entrance upward facing the tube, but may vary, and it is advisable that the operating surgeon supervise the taking of the film. A site directly over the suspected location of the foreign body is selected. The wound of entrance, palpation, site of tenderness, Bierman localizer, if available, or information from previous x-ray films, are all factors in determining this point which will lie in the eventual surgical approach. A lead marker presenting prominent angles, such as a "1" or "7," is fastened to the skin at this point with adhesive. The focal point of the x-ray tube is placed vertically above this marker. The focal film distance is measured accurately. An exposure one-half the usual amount for the part is taken. The tube is shifted a measured distance and a second exposure made. Care is taken that neither the patient nor the film moves between exposures. The film when developed shows double images of the skin marker and the foreign body. They are usually not very distinct, but are readable. The distance between each double image is called the image shift. The image shift of the skin marker is always greater than that of the foreign body because it is further away from the film. Knowing the focal film distance and the shift of the tube, the location of an object along the focal film line can be determined by triangulation from a measurement of the shift of its image on the film. To do this a chart is constructed (Fig. 1) which reproduces the conditions under which the film was exposed, as follows:

Draw line "AB" the length of the focal film distance.

At one end draw line "AC" the length of the tube shift at a right-angle to "AB." At the other end of "AB" draw line "BD" at a right-angle in the opposite direction to "AC" and the length of the image shift. A line drawn from the tube shift "C" to the image shift "D" will cross line "AB" at point "F." The distance of this point from the film "FB" is measured directly.

To locate the skin marker a second line is constructed from the tube shift "C" to the image shift of the skin marker "E." This will cross the focal film line at point "G." The distance "FG" is the depth of the foreign body below the skin surface.

Since both points "F" and "G" are determined by the same set of variables, the method of double triangulation just described is more accurate than the method of single triangulation, in which point "G" is determined by direct measurements of the tube skin distance.

If the tube shift and focal film distance are accurately measured and there is no movement of patient or film between exposures, the accuracy of the method is limited only by the accuracy with which the chart is drawn. It is not easy to draw a good chart. To avoid the error of a poor chart and the necessity of having to construct a drawing for each case, I have prepared two charts from which points "F" and "G" can be read directly from the image shift.

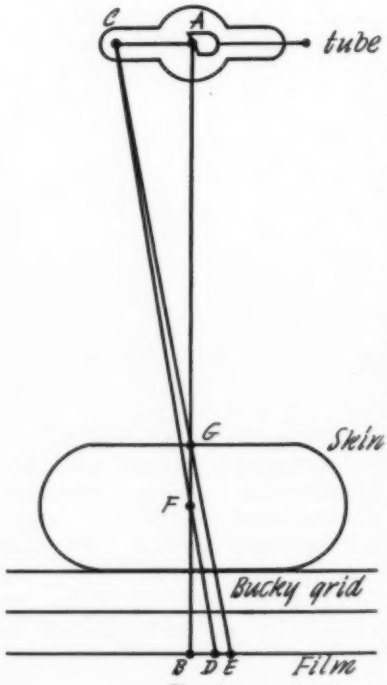


Fig. 1.

In the construction of both tables a tube shift of four inches was used.

Fig. 2 for a focal film

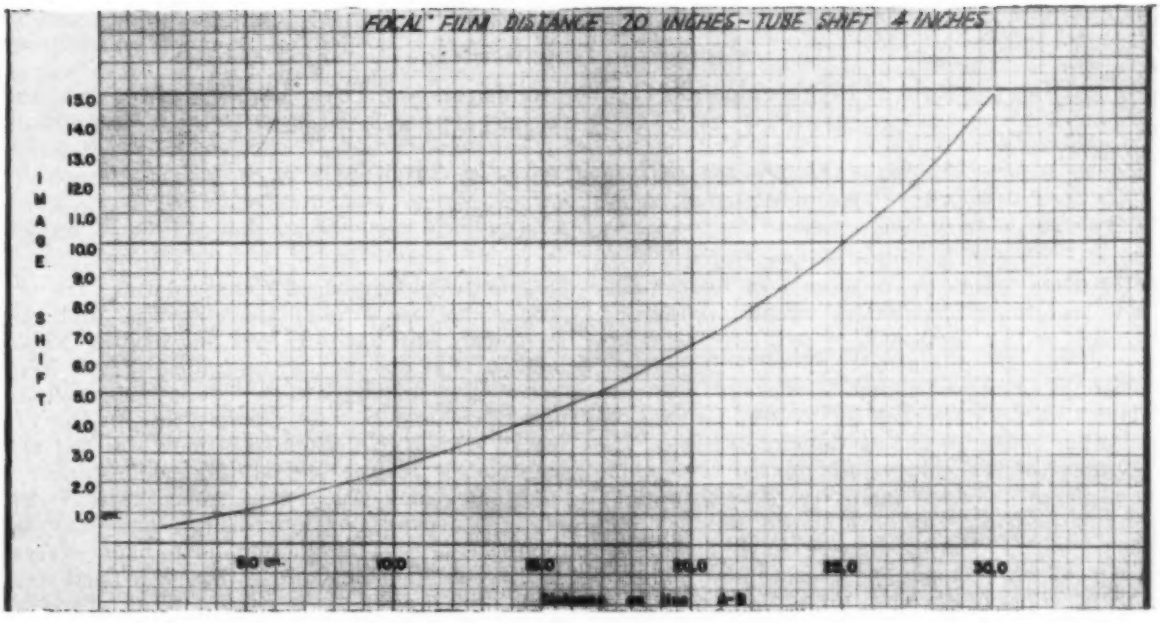


Fig. 2.

distance of 20 inches is used for extremities. This is a shorter distance than the usual 30 odd inches used for extremity x-rays. It was selected because it produces a greater image shift, which makes the measurement on this film easier and more accurate.

Fig. 3 for a focal film distance of 40 inches is used for the trunk, or thighs and shoulders in large individuals. This allows plenty of room for the cone to clear the patient, and in these locations the foreign body is far enough from the film to give a sizeable image shift.

To use either chart the proper focal film and tube shift distances are selected and the double exposure made. The image shift of the skin marker is measured and located on the abscissa. The point where this intersects the curved line is read on the ordinate. This is the distance of the skin marker from the film. The distance of the foreign body is determined in the same manner. Subtraction gives the distance of the foreign body below the skin surface.

Sometimes it is possible to determine the image shift of a familiar bony landmark, such as a spinous process, and gain another point of orientation from the tables. In measuring the image shift a prominent point is selected on one image and measurement made to the same point on the second image. In the case of a needle, or other long object, a measurement can be taken from each end and the depth of each end below the skin be determined.

CONCLUSION: Double triangulation gives an accurate estimation of the depth of a foreign body below the skin surface. With this information removal is facilitated and fluoroscopy is rarely necessary at the time of operation. No special x-ray apparatus is required. Tables by which measurement of depth can be read directly from the image shift have been presented as an original contribution.

Though not printed to scale, the charts shown here may be used in applying the method to clinical cases.

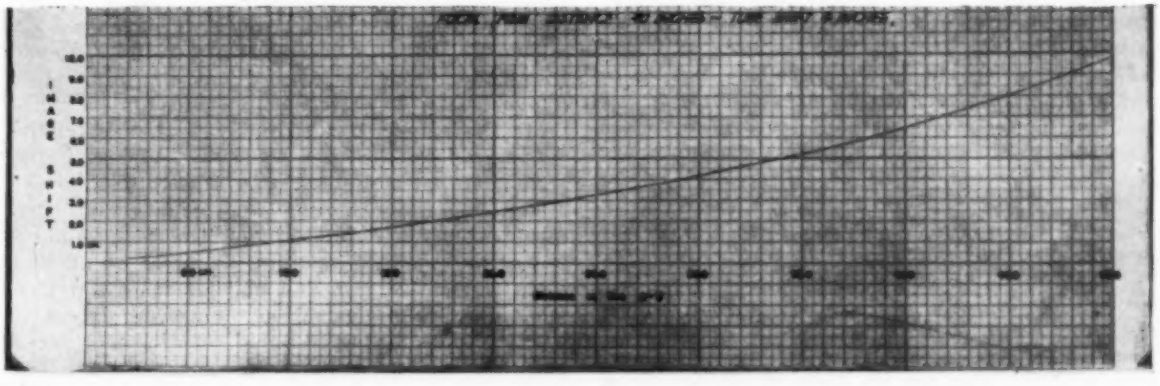


Fig. 3.

Metastatic Calcification
—Is the Role of Hypercalcemia Over-emphasized as a Toxic Manifestation of Vitamin D Therapy in Rheumatoid Arthritis?—

ABRAHAM COHEN, M.D., and JOHN G. REINHOLD, Ph.D.,
with the technical assistance of
ROSLYN COHN

WITHIN recent years reports of toxic manifestations of intensive vitamin D therapy as used in the treatment of arthritis have attracted considerable attention.[109-113; 115-123; 127-131] Of the effects attributed to vitamin D, ectopic calcification of kidneys, blood vessels, lungs, skin and other organs is among the more serious. Involvement of the kidney has induced fatal renal insufficiency in some instances. In contrast to the few patients who have shown serious toxic effects, a very large number have undergone treatment with comparable dosages of vitamin D with no signs of toxicity, or at the most easily controlled minor effects. We have been concerned with this exceptional susceptibility of certain individuals to the action of vitamin D, and in this paper have attempted to evaluate the factors involved in the hope that the cause could be identified.

Etiology of Calcification

ECTOPIC or metastatic calcification is indeed a common occurrence if one includes in this category the dystrophic deposits of calcium that are so ubiquitous in blood vessels and lungs. The more extensive deposits of calcified material that would comprise the usual concepts of metastatic calcification are encountered with sufficient frequency to have provided the subject matter of several hundreds of reports since Virchow's original description in 1856.* Thus it is established that in many individuals ectopic deposits of calcium occur spontaneously. In his comprehensive review of metastatic calcification, Mulligan[24] lists the following major causes: bone disease, mainly of neoplastic origin, chronic renal disease, hyperparathyroid states and hypervitaminosis D. In addition, arthritis, tuberculosis, severe and prolonged vomiting due to various causes, and acute disease may lead to extensive calcification of metastatic type.

Less commonly encountered are the diseases in which extensive calcification of non-osseous tissues constitutes a predominant feature. Myositis ossificans and calcinosis universalis, the latter frequently associated with scleroderma, are examples. Myositis ossificans[92-108] was first described by Guy Patin in 1692 and next by Freke in 1740. The disease may be traumatic with local calcification or progressive. The latter is usually hereditary and is most common before the fifteenth year of life. Change in muscle as yet not identified is responsible for this calcification.

Ectopic calcification may be associated with secondary hyperparathyroidism. Both may be the result of bone destruction due to many causes, such as carcinomatosis.[42] In these circumstances, it does not necessarily occur as a result of hyperfunction of the parathyroids, since the latter may undergo hyperplasia in an effort to compensate for calcium deficiency. Likewise hyperphosphatemia due to chronic renal disease[43-51] may produce ectopic calcification and hypertrophy of the parathyroids. Abnormal calcification here is explained by the primary elevation of phosphorous concentration and the supersaturation of body fluids with calcium phosphate that results.

In many of the circumstances in which ectopic calcification occurs the causes are obscure. Wells, Holmes and Henry[1] reported that "temporary anemia and certain poisons" produce calcification of renal epithelium and tube casts in rabbits. Wells[2] postulated that "when blood loses its CO_2 in the lungs, calcium precipitates as a mixture of phosphates and carbonates in the alveolar walls, the pulmonary veins, and even further along in the left auricle and ventricle, and in the coronary arteries." Mair[10] suggested that calcinosis may be due to a "primary disturbance of development in the mesenchyma in which the potential function of osteogenesis has been impressed on all connective tissue structures—plus a disorder of calcium metabolism—'some inborn error of metabolism (Garrod)'." Mark Butler[4] reported that mice fed acid diets developed deposits of calcium in the heart and kidneys. Barr[11] found that "rats fed on high calcium, high phosphorus, acid or alternating acid and alkaline diets for a period of 15 days, show extensive soft tissue calcification. However, under similar conditions with diets low in phosphorus no calcification occurred, nor was calcification produced when the acid diet was rich in phosphorus but without added calcium. Neutral or alkaline diets rich in calcium and phosphorus did not result in calcium deposition. Thus an excess of calcium, phosphorus and acid reaction was necessary for the production of metastatic calcification, under the conditions of his experiments.

From the Arthritis Clinic and the Division of Biochemistry, Philadelphia General Hospital.

*In 1911, Wells[3] had already summarized findings in 32 cases of calcinosis; and up to the year 1935 numerous additional case reports had appeared.[5-10 12-22 42 52 53 55-66] Steinitz[62] who reviewed the literature reported 105 instances of calcinosis. Since 1935, the year that high potency vitamin D[58] was suggested for use therapeutically, numerous other cases of calcinosis have been reported.[25-41 43-50 66-76 78-92 99-111] Of these, well over 100 were indexed within the period 1941 to 1946. Few were concerned in any way with the effects of administration of vitamin D.

Jones[23] postulated that (a) bone undergoes decalcification if the blood supply is increased, and increased calcification if the blood supply is diminished; (b) pathological calcification is observed in any mesenchymatous tissue of low metabolism when the vascularity is further reduced by the fibrosis of trauma or of infection; (c) bone may form in any region where there are fibroblasts, excess of calcium and an adequate blood supply.

Two factors must be considered in the study of metastatic calcification. One is the alteration in composition of blood plasma and interstitial fluid with respect to calcium, phosphorus, protein or hydrogen ion concentration that favors deposition of calcium phosphate or carbonate. The other is the change in the tissues that permits calcification. The latter may be sufficient to bring about calcification without appreciable change in composition of blood plasma, or both factors may be operative.

Extrinsic Factors Favoring Metastatic Calcification

IN THE tissues more than one mechanism is involved in the deposition of calcium phosphate. Gomeri[67] found intense alkaline phosphatase activity to be associated with metastatic calcification in living or recently necrosed tissue.

However, calcification of hyaline connective tissue appeared to be unrelated to phosphatase action.

Among the alterations in chemical state of the cells that may contribute to calcification are included injury resulting from many causes, rise in pH, impaired nutrition or oxygen supply due to impeded flow or other cause, lack of essential co-factors such as potassium for phosphorylation reactions, or interference by calcium with certain enzymatic reactions.

Calcinosis has been described as a prominent symptom of a dietary deficiency of what Van Wagtendonk and Freed[124] have called the antistiffness factor. Extensive deposition of calcium phosphate was found by these workers when guinea pigs were fed restricted diets. Calcinosis from this cause could be prevented by administration of a crystalline material obtained from cream or cane-juice. However, deficiency of this factor has not been recognized in man.

The published descriptions of vitamin D toxicity suggest that both humoral and tissue factors are concerned in the ectopic calcification that has been observed in some patients. Among the more conspicuous chemical changes is the rise in serum calcium concentration. Most individuals treated with vitamin D preparations in large amounts respond with a rise in serum calcium concentrations to values appreciably higher than normal, yet harmful effects appear to be exceptional.

One of the more common misconceptions is to assume that hypercalcemia by itself constitutes a toxic effect. Steinberg[114] observed that elevated concentrations of serum calcium were well tolerated by vitamin D treated patients. One of us (A. C.) has found this to be true also of the patients treated with vitamin D at the Arthritis Clinic of the Philadelphia General Hospital, as data presented elsewhere in this paper will demonstrate. In such individuals the required change in the tissues either pre-existing or caused by vitamin D presumably would not have occurred or the rise in calcium may have been counterbalanced by a decrease in phosphate. This will be discussed later. On the other hand, an appreciable number of the patients presented as examples of vitamin D induced metastatic calcification by various authors have shown little or no rise in serum calcium. It is possible that in the latter some subtle change, not revealed by ordinary analyses, such as a change in calcium ionization, has occurred in the blood. Thus, ionized calcium concentrations may be elevated in plasma without a rise in total calcium if the concentration of protein is decreased or if the capacity of plasma protein for combining with calcium is diminished. Little is known about the latter, although evidence for change in protein has been discussed by Rawson and Sunderman.[126] Difficulties in measurement of ionization of calcium in serum prevent precise evaluation of such changes. Significant alteration in ionization of serum calcium moreover would imply defective parathyroid regulatory control for which evidence at present is lacking in vitamin D treated subjects. Electrocardiographic studies in the fatality attributed by Bauer and Freyberg[122] to the effects of vitamin D showed no shortening of the QT interval characteristic of a marked increase of ionized calcium.

Serum calcium concentrations found in 47 patients with rheumatoid arthritis representative of a much larger group of some 150 patients undergoing treatment with vitamin D* are summarized in Table I. Concentrations ranging from 12 to 16 mgms. per 100 ml. have been common. Many of these patients showed serum calcium concentrations within the range considered by some to be pathognomonic of calcinosis or other

TABLE I.
SERUM CALCIUM CONCENTRATIONS OF 47 ARTHRITIC PATIENTS DURING ERTRON THERAPY

Serum Calcium	Total Number of Months	Toxic Effects No. of Patients
9-10	51	
10-11	66	
11-12	87	
12-13	115	1
13-14	102	1
14-15	61	1
15-16	27	
16-17	2	

*High potency vitamin D, "Ertron," was administered in capsules of 50,000 international units each. Patients were instructed to drink at least one quart of whole milk daily. Three capsules were administered daily for one week. If this was tolerated it was to be succeeded by six capsules daily.

In the event of a gastric upset, the patients were told to remove the material from the gelatin capsule and to take it as a powder. It was found that this precaution was almost always effective in eliminating gastric irritation.

Serum calcium concentrations were measured in specimens obtained about one hour after a light meal and for this reason may be slightly higher than fasting values.

toxic manifestations. Despite this, toxicity was rarely observed and was limited to nausea or polyuria. No evidence of ectopic calcification or calcinosis could be found during treatment periods that extended up to 30 months. A transitory increase in blood urea nitrogen occurred in three patients. This may have been caused by vitamin D, however, subsequently values in each instance had become normal while therapy was continued. These findings support Reed's assertions[132] that elevated serum calcium alone does not constitute evidence of toxicity, and suggest in addition that humoral changes alone are not responsible for ectopic calcification. Changes in the tissues, therefore, must be of predominent importance.

Elevated serum inorganic phosphorus concentration either with normal serum calcium or with elevated serum calcium could be an immediate cause of ectopic calcification and several of the patients whose histories are published as examples of toxicity show such changes. When elevated values do occur it is usually in association with elevation of blood urea or non-protein nitrogen as a result of renal insufficiency.

Interference with or impairment of the efficiency of phosphorylation will have another indirect effect upon the serum phosphate concentration in that the uptake of phosphate by the liver and other tissues will be lessened following meals. In the normal individual, plasma phosphate falls approximately 1.0 to 1.5 mg. per 100 ml. below the fasting concentration following a meal while phosphorylation reactions are preceding actively at their maximum rate. During the interval that plasma phosphorus is lowered, the degree of saturation of the plasma with calcium phosphate is lowered during an appreciable period. The patient who eats little or omits meals will have a higher average phosphate concentration during the day than one who eats well. At a given concentration of calcium in serum, calcification can be expected to occur more easily in such an individual. We have studied the serum phosphate response as shown in blood specimens collected about one hour after a light meal in patients who had received vitamin D in high concentration. The averaged response of 30 patients is shown in Fig. 1. At the beginning of the treatment period, the decrease in phosphate concentration was similar to that observed in normal individuals. With continuing treatment, phosphate values became lower in most patients following the meal, and minimal post-prandial values were observed for about eight months after treatment was started. As treatment continued the response tended to become less marked and showed a trend toward that observed in untreated subjects. Only three patients differed in that the progressive lowering of post-prandial phosphate was not observed. Fasting serum phosphate concentrations remained unchanged during the treatment period.

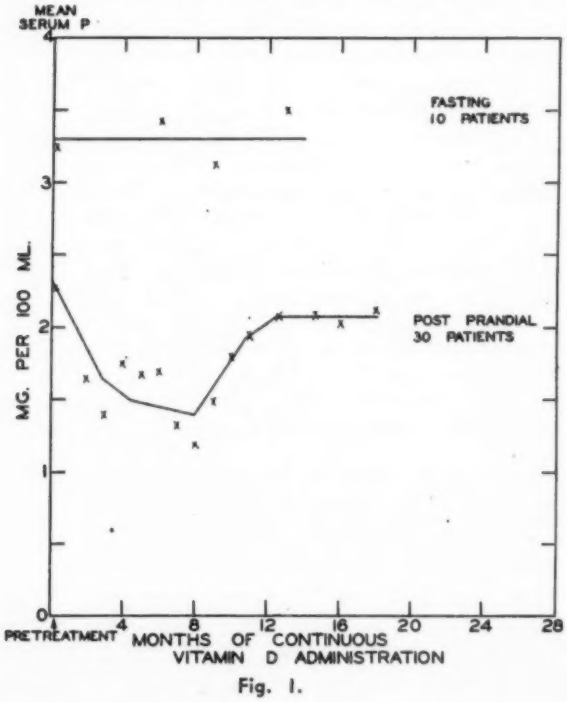


Fig. 1.

The change in phosphate response to meals is reflected in a decrease in the solubility product of calcium phosphate as calculated from the composition of post-prandial blood serum. The solubility product is obtained by multiplying the cube of the calcium concentration by the square of the phosphate concentration (in millimols per liter).[133] There appears to be a trend of the solubility product in the course of vitamin D therapy similar to that shown by phosphate. The decrease in solubility product indicates diminished tendency toward calcification. The subsequent rise suggests that the hazard of ectopic calcification may increase following the first six to 12 months of treatment. The solubility product calculated from calcium and phosphate values of fasting blood is greatly increased in many vitamin D treated patients.

Calcification is favored by alkaline pH and hindered by increased acidity. No plasma pH values have been found in the descriptions of vitamin D toxicity, however several authors have measured the alkaline reserve. One high value of 73 volumes per cent is reported by Tumulty and Howard,[118] but normal values are reported by Paul.[123] It is unfortunate that the measurement of plasma pH is not more frequently made in vitamin D treated patients especially since vomiting, one of the important manifestations of toxicity, may lead to alkalosis and this in turn may lead to rapid deposition of calcium phosphate. Only one report, that of Crimm and Strayer[125] includes plasma pH. They found it unchanged in tuberculous patients treated with vitamin D.

The infrequent occurrence of toxicity in patients treated with vitamin D in this clinic has led us to review the reports of ectopic calcification and other toxic actions attributed to vitamin D therapy. In most patients showing signs of toxicity, the action of the vitamin probably has

been enhanced by the presence of factors increasing its potency or aggravating its effects. In some, potentiation so induced could explain the toxic effects attributed to vitamin D. Thus, one of Paul's[123] patients was a 65 year old woman who a year previously had experienced congestive heart failure following coronary occlusion. Soon after she increased the daily intake of vitamin D to 400,000 U.S.P. units, nausea, vomiting and abdominal distress appeared. Congestive failure recurred as it might in any individual under similar circumstances. Extensive calcification of the aorta was detected. This is commonly encountered in older individuals with heart disease. While the relationship of this patient's major complaints to the vitamin therapy is questionable, intensive vitamin D therapy presumably favored deposition of calcium. Nevertheless, disease of heart and blood vessels may interfere with nutrition of the tissues to an extent sufficient to permit calcification. Thus caution is desirable both in treating such patients with vitamin D, or in attributing calcification in such individuals to the vitamin therapy.

Metastatic calcification is a common feature of arthritis untreated with vitamin D. This may be traumatic in origin in some instances, and in others it is the result apparently of disturbed tissue metabolism. Shelley[77] has described extensive calcification of subcutaneous tissues occurring in chronic atrophic arthritis. Funsten[134] directed attention to the arthritic symptoms associated with hyperparathyroidism. The frequency with which tissue calcification occurs spontaneously in arthritics untreated with vitamin D again necessitates restraint in attributing metastatic calcification in arthritic patients to such therapy. On the other hand, the high frequency of calcified areas in arthritic patients may indicate greater susceptibility to factors causing calcinosis, and hence the need for more careful observation of the patient if vitamin D is used therapeutically. Albright[138] has demonstrated that immobility may cause increased excretion of calcium in urine sufficient to lead to formation of renal calculi. Recently Deitrick, Whedon and Shorr[135] also found large losses of calcium and nitrogen to be caused by immobilization. Serum calcium rose significantly in their subjects. In the report of Tumulty and Howard[118] ascribing severe toxicity following extensive fractures to large doses of vitamin D, both patients were immobilized. Inspection of the descriptions of vitamin D toxicity by others show that immobility or restricted activity was a frequent characteristic among those susceptible. In some patients, immobilization was the result of arthritis while in others it was due to incapacitating illness. All patients treated in the Arthritis Clinic of the Philadelphia General Hospital were ambulatory, a factor that cannot be neglected in accounting for the low incidence of toxicity.

Many of the patients cited as showing toxic effects of vitamin D were poorly nourished judging from their histories, hypoalbuminemic,[115] anemic,[119] or had suffered from prolonged debilitating illness before vitamin D was administered. Such patients at times manifest disturbances of calcium metabolism and will be more vulnerable to vitamin D action. Some of the patients whose histories appear in the literature were given milk with or without calcium during vitamin D therapy. One patient described as having severe toxicity subsisted almost entirely on milk or milk-dishes. Opinion differs as to the desirability of milk as an adjuvant, since the increased calcium intake is thought to increase the hazard of calcification. Others believe milk is protective although excessive amounts would be undesirable. Patients treated with vitamin D at the Philadelphia General Hospital received one quart of milk daily with, as has been pointed out, the occurrence of no more than trifling toxicity.

The effects of starvation upon serum phosphate concentrations have been mentioned. Vomiting, if it continues, by causing starvation as well as alkalosis, may lead to ectopic calcification. One patient[122] with extensive ectopic calcification attributed to vitamin D was found to have a penetrating duodenal ulcer and many smaller ulcerations. Emesis had been severe. Vomiting, therefore, necessitates discontinuation of medication with vitamin D. Failure to recognize this appears to have aggravated toxic effects in several patients.

Renal injury is listed as one of the more frequent consequences of therapy with vitamin D. That calcification of the kidneys may occur as a result of vitamin D administered in large amounts is well established. However some doubt may exist as to the justification of attributing kidney damage in elderly patients with histories of disease of the urinary tract to this agent. Again, the desirability of screening the patients before initiating therapy and of exercising extra care when such patients are treated is evident. Toxic nephrosis has been observed by Corcoran, Taylor and Page[139] in two patients treated with large amounts of vitamin D.

Certain other factors may cause or contribute to metastatic calcification. Lowered oxygen supply to the tissues causes release of considerable amounts of phosphate by breakdown of organic phosphate compounds (Colldahl[136]). The injured cells not only lose phosphorus, but also become permeable to calcium. Deposition of calcium phosphate may result.

Discussion

VITAMIN D in large doses may have important effects on metabolism. Calcium is known to participate in the action of several respiratory enzymes.

Since calcium remains outside of the cells while the respiratory enzymes concerned are within the cells, the effects of the increased calcium concentrations resulting from intensive vitamin D therapy are difficult to define. It is possible that calcium penetrates certain cells, such as those of the kidney tubules, and also that enzymatic re-

actions occur at the cell surface. In either instance, calcium concentration would be highly important.

High concentrations of calcium could influence cellular metabolism by combining with phosphate that may escape from or that is en route to the cells. Phosphate is required by the cells in considerable quantity, especially during periods of high metabolic activity after meals or insulin.

An increased uptake of phosphate by tissues following a meal probably exerts some protective effect in vitamin D treated patients, resulting in lowered phosphate concentrations and decreased solubility products of calcium and phosphate ions of serum.

Actually, vitamin D therapy stimulates metabolic activity, and phosphorylation reactions appear to have been accelerated in our patients during the first six to 10 months of therapy. This effect disappears during the later months. Together with some evidence of an increasing hazard of calcification, this suggests that prolonging vitamin D therapy beyond one year may be inadvisable.

Loss of appetite, decreased food intake and especially gastro-intestinal symptoms referable to vitamin D therapy should receive attention. Experience in this clinic indicates that the hazards of vitamin D therapy are not as great as one might conclude from published reports.

Appraisal of many of the such reports of toxic effects of vitamin D indicates that factors such as debility and advanced age, severe malnutrition, heart and kidney disease, immobilization or the presence of diseases frequently characterized by ectopic calcification have had an important role in causing or accentuating toxic effects attributed to vitamin D therapy.

Beyond any doubt, the greatest hazard from intensive vitamin D therapy exists in the unsupervised or poorly supervised use of this material for long periods. Proper selection of patients, reasonably close supervision in order to enable detection of the early evidences of toxicity, and finally limiting the time that vitamin D is used should markedly lower the hazards of toxicity.

Summary

THE use of large dosages of vitamin D in treatment of rheumatoid arthritis has been characterized by almost complete absence of toxic effects, despite serum calcium concentrations sustained at high concentrations for periods up to 30 months.

2. Toxic effects may be caused either by humoral changes or by alterations in the tissues.

3. The factors involved have been explored in relation to the physiological functions of calcium and phosphorus. Phosphorylation appears to be stimulated in vitamin D treated patients.

4. Review of reports in the literature of severe toxicity attributed to vitamin D indicates that the presence of contributing factors may be of great importance in eliciting toxicity and that in some instances the importance of vitamin D as a causative agent may have been over-emphasized. The nature of these contributing factors has been discussed.

[NOTE: The bibliography accompanying this article is probably the most comprehensive assembly of references on this subject ever compiled. It contains 139 citations to the medical literature of the world. Because of its length it is omitted here, but it is included in a reprint of the article which will be mailed to any reader on request.—ED.]

ATTEMPTS at food control are almost as old as history. It was tried in Egypt in 2800 B.C., and the end result was a system of land tenure under which the land became the personal property of the king. It was tried in China and Athens and Rome. Much later it was revived in England, Belgium and other countries, always with a similar lack of success. And, though few Americans know it, price-fixing was attempted in this country during the colonial era, and totally failed to remedy the problem it was supposed to cure. "The history of government limitation of price seems to teach one clear lesson: That in attempting to ease the burdens of the people in a time of high prices by artificially setting a limit to them, the people are not relieved but only exchange one set of ills for another which is greater." When price control was tried 4000 years ago it led to a decline in production, to the withholding of goods from a market which was no longer profitable, and to a raging black market. It did exactly the same thing here when it was continued for a time after the last war. Only a free enterprise economy, in which manufacturers, farmer and retailers must compete for business, can produce abundance. And only free competition, all the way from the source of raw materials to the stores in which finished goods are sold, can establish a price which is fair, and is based upon the going cost of doing business.

—*Weekly Bulletin, St. Louis, Medical Society*, October 22, 1948.

"Health Hits the Highway"
—American Brake Shoe's Mobile X-Ray—

How the benefits of periodic chest x-ray can be brought to 10,000 employees scattered throughout 60 plants in 23 states and Canada is demonstrated by the American Brake Shoe Company. After six years' trial of mobile x-ray apparatus, employing a knockdown 14 in. x 17 in. film x-ray unit transformer in a station wagon, the company recently went all the way, acquiring a G-E photo-roentgen bus especially designed for mobile survey work.

The reason for this, according to DR. L. E. HAMLIN, medical director, was to cut film costs and boost speed and efficiency through the use of miniature (4 in. x 5 in. single-frame) film, and to take advantage of the marked psychological effect produced among employees by the sight of the attractive, especially-equipped bus. During the first visit of the bus to a plant recently employees would linger around after work to watch the unit in operation; in fact, several lined up for x-rays before the unit was ready to operate. By psychological effect is meant not only boosting morale and company loyalty but also further increasing the already high participation among employees in the surveys at each plant.

Use of the new bus offers several advantages over the hauling of a transportable unit throughout the country. Besides the gain in efficiency and cost-reduction already mentioned, there is also the elimination of set-up and dis-assembly time; the provision of darkroom facilities right in the bus itself; and the elimination of danger and expense of moving valuable equipment around by hand. Cost of the fully-equipped bus was $20,000.

According to DR. HAMLIN, where the company formerly felt lucky if it could survey 10 plants a year, it will now be able to cover at least half of its 60 plants in that period (doing a complete survey of all employees in each), thus more than tripling its original capacity to safeguard the health of its working force. Eventual aim is to survey each plant 100% once a year. The task of conducting the surveys is handled by one technician who drives the bus, and takes and develops the film. Thirty-two nurses stationed in the various plants aid him in setting up the surveys.

American Brake Shoe Company handles the periodic examination program, but for pre-employment examinations it refers employees to local industrial physicians who render regular medical service to its plants. All medical records of employees are filed at the medical department headquarters in Chicago. In plants having full-time nurses, duplicate records are kept in the first aid department. In both cases, the records are entirely confidential. Reports on all findings are made to the employee directly. Interpretation of routine periodic x-ray films is done at the medical department by DR. HAMLIN and his associates.

In 1947, in both pre-employment and survey-type examinations, the company found 40 cases classified as either active or indeterminate tuberculosis (27 were found in 1946). (The indeterminates could not be proved inactive without further study.) All of these would have gone unrecognized had it not been for x-ray. Discovery of one such case alone would have justified the entire cost of the x-ray program for that year.

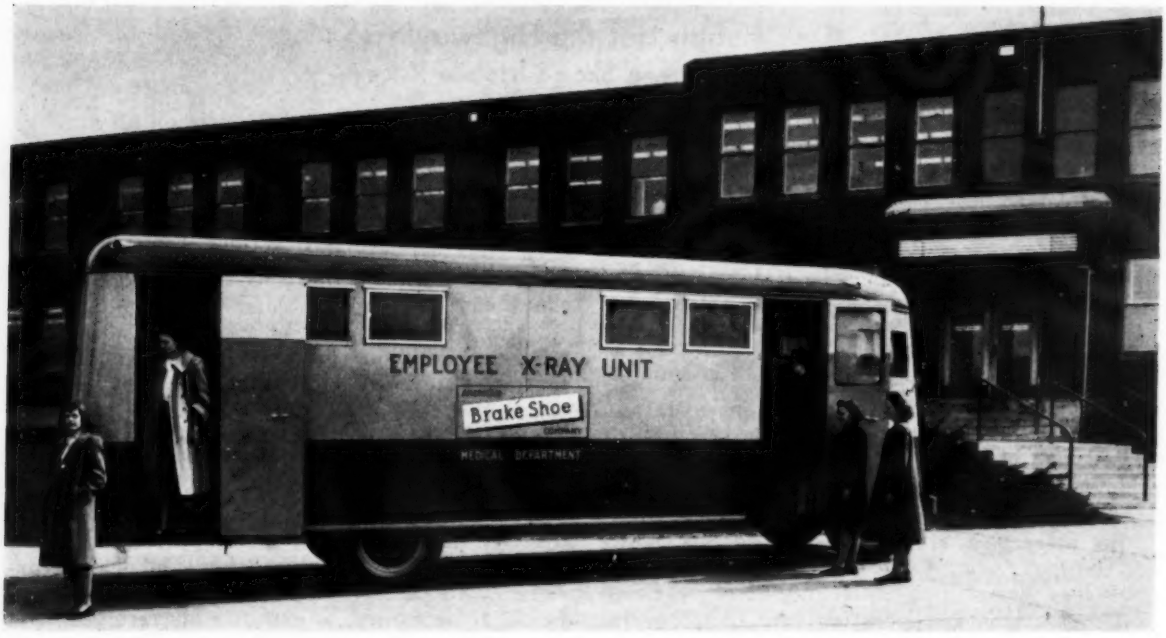
No employee is discharged for pathology uncovered. In these cases, the employee is advised as to the best course of action, and special arrangements can be made through plant welfare funds, if necessary, to expedite his receiving full and adequate attention.

Besides tuberculosis, several other conditions may be anticipated, particularly among industrial workers—silicosis and siderosis (pigmentation of the lungs due to iron dust). The latter is inert but shows shadows similar to those of silicosis. It is important to differentiate it from tuberculosis and silicosis, since many cases of siderosis have been improperly classified. The diagnosis of silicosis must be based on "exposure to significant concentrations of respirable-sized particles of free silica over long periods of time (two to 25 years—average 10)." It has been demonstrated, that particles over 10 microns in size have no clinical significance since they rarely reach the alveoli of the lungs. Where x-rays indicate the possibility of occupational disease, the medical director discusses the matter personally with the employee.

All employees showing occupational fibrosis are x-rayed annually, whether the bus reaches their plant that year or not.

The new bus, in addition to x-ray equipment specially mounted to withstand cross-country traveling, and the darkroom previously mentioned, also has 150 feet of cable for electrical connections, thus facilitating setting up operations in any location convenient for employees. Lead partitions, with leaded-glass windows for observation, are placed before and after the section containing the x-ray tube. Thus, the technician making the exposure at the control stand is protected from repeated exposures, as are also employees who stand around before and after exposure. A photo-timer, used with the equipment, automatically varies exposure time to suit the thickness of the individual chest. The darkroom features a splash-proof developing tank; also a light-tight box for passing film in and out of the darkroom without admitting light into that room; and a 35-gallon water storage tank.

The title of this article is from *Brake Shoe News* (September-October, 1948) which published a summary of the information here given.



Other vital equipment includes four 100-watt heaters, safety-glass windows, a coat closet, wash bowl, fluorescent lighting, weatherproof ventilator and ventilating fan, walls and roof insulated with glass wool and covered by fir plywood interior and exterior walls, jacks to stabilize the vehicle when parked for a survey and tubular-steel welded structure providing the strongest possible construction with minimum weight.

With a set-up such as this, it is possible to take as many as 300 films per day, where peak loads are encountered. However, American Brake Shoe plans to average approximately 200 daily.

American Brake Shoe Company adopted its policy of routine periodic chest x-rays in 1932 as part of an over-all health protection program. Believing that healthy-satisfied workers are one of its greatest assets, it has proved, through the current program, that when management extends itself to such an extent to safeguard health, the results greatly exceed expectations. Chest examinations by x-ray are made on company time.

While this company is unusual in the number and location of its plants, the experience it has gained can be profitably studied even by smaller firms. At present a considerable gap exists between individual firms, such as American Brake Shoe, with its own bus, and the thousands of firms served sporadically via their county tuberculosis association bus. To accomplish employee protection on the scale found necessary by American Brake Shoe, industries located in one area would either have to contribute further to the support of TB association surveys or join forces in the procurement of their own x-ray apparatus.

The x-ray program in industry is not only a matter of routine periodic examinations and preplacement radiographs, but also rechecking cases under suspicion. At American Brake Shoe, rechecks must be made at intervals of from three to six months. All such cases are recorded on a tickler file by the medical department, and the various plants are notified with regard to recheck x-rays required of certain employees.

A study of American Brake Shoe Company reveals a diversified type of manufacture not indicated by the firm's name: Six of the 10 divisions into which the company is divided are engaged in foundry operations, producing grey iron, nickel and chrome alloys, manganese steel and brass castings. The others manufacture such products as upset and drop forgings, railway switches, frogs and crossings, special alloys, automobile brake linings, paint sprayers and compressors.

DR. HAMLIN'S industrial hygiene program is compounded of equal parts of the following ingredients, all necessary to its success:

1. Full backing is given by top management.
2. The medical department is responsible only to top management.
3. Full latitude of operation is permitted.
4. Financial assistance in research problems is given.
5. Attendance at scientific meetings and membership in scientific societies at the company's expense is encouraged.
6. Authority to acquire necessary equipment is readily granted upon justification.
7. While the program can be forced from the top down, it is sold from the bottom up.
8. All divisions annually budget sums of money for improvements in plant hygiene, and the medical department has the principal voice in recommending what those improvements are.

On the Treatment of Pulmonary Tuberculosis

THIS paper reviews a theory of pathogenesis of apical tuberculosis and the rationale for bed rest therapy resulting therefrom. It discusses briefly pertinent facts relating to collapse therapy, diet of tuberculous patients, the possible use of insulin, and a method for the relief of cough.

An evaluation of the antibiotic streptomycin is also presented.

A Theory of Pathogenesis

A THEORY of pathogenesis of apical tuberculosis combines facts from anatomy, pathology and clinical medicine with data on the pressure in the pulmonary artery of human subjects. This explanation provides a physiologic rather than an empiric basis for what is still the most widely and effectively used therapy—bed rest in the open air.

"When an adult of medium height is standing or sitting, the weight of the column of blood rising from the right ventricle to the apices of the lungs is greater than the mean pressure in the pulmonary artery; in a tall, narrow-chested person, the column of blood exerts a pressure greater even than the systolic pressure in the right ventricle. As the veins collapse easily, they cannot siphon blood over the apical capillaries and back to the left auricle. Thus one of the sequels of man's erect posture is to reduce the blood flow to the upper parts of the lungs to nil if the cardiac output and the pulmonary arterial pressure are at their basal levels, unless the subject lies down."

The apical regions, deprived of inflow of blood of venous character, but well ventilated, will contain alveolar air richer in oxygen and poorer in carbon dioxide than the rest of the lungs. This favors the growth of tubercle bacilli. In the bloodless zone, toxins will accumulate without possibility of dilution or removal in the lymph, as tissue fluid cannot form. Few phagocytes or none will enter the region until the person lies down and blood flow is restored. Silica dust coming into this part of the lung will accumulate because of the decreased lymph flow.

The theory accounts for the frequency of apical tuberculosis in those young adults who get little rest and are continuously erect 14 to 20 hours daily. It also explains why bed rest alone is effective in so many cases but of much less value in those with pulmonary basal lesions or tuberculosis of the kidney, epididymis, or skin.

The effectiveness of bed rest is greatly increased by outdoor exposure during the day, as the breezes and bright light discourage reading and promote appetite and sleep by stimulating the skin and tiring the eyes. Brief intervals out of bed for meals and to facilitate nursing may favorably affect the "cure" and make it less demoralizing and costly.

General Measures of Treatment

ABSOLUTE rest in bed during febrile periods.

2. Followed later by carefully graduated activity.

3. Sufficient dietary of nutritious and palatable foods.

4. Treatment as much as possible in the open air.

5. Skilled medical supervision at all times.

6. In any case the minimum amount of bed rest should be three months; in some cases six months, a year, or longer.

Collapse Theory

THERE is still disagreement among authorities as to the indications and contra-indications for collapse therapy. No one advocates its use indiscriminately in all forms of pulmonary tuberculosis. Mayer (1942) stated that collapse therapy should be utilized only: After bed rest has been given adequate clinical trial; when the character of the lesion is such that rest alone offers no hope of success; when collapse is required for the safety of the patient as in instances of hemorrhage or if there is imminent danger of spread of the disease.

Diet in General

THE ordinary balanced house diet is adequate for the great majority of patients with pulmonary tuberculosis.

2. Increase in weight in those below par should be accomplished primarily by proper attention to the disease itself.

3. Strange supplementary foods are not indicated.

4. Overfeeding is unnecessary and unreasonable. It may be harmful, for extra weight taxes the pulmonary function.

5. Milk should not be forced as an accessory food.

6. There is no proof that unusual quantities of eggs are helpful.

Vitamins

SWEANY (et al) conclude that no patient should have less than the standard optimum dosage of 50-60 mg. daily of ascorbic acid; the amount being increased to as much as 200 mg. daily in relationship to the severity, activity, and dur-

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[NOTE: This abstract is from the *Medical Bulletin*, published by Standard Oil Company (New Jersey) and Affiliated Companies. DR. ROBERT COLLIER PAGE, General Medical Director, writes that it was prepared by a member of his staff (JAMES R. MCMILLAN, M.D.); and DR. LEO PRICE, Chairman of the AAIP&S Committee on Tuberculosis, says of it: "This article illustrates the general point of view of Standard Oil Company's medical department in relation to the treatment of tuberculosis among employees. Physicians in the industrial field will find its concise descriptions of interest."—ED.]

ation of the disease. Adequate vitamin C is a necessary factor in the proper treatment of tuberculosis.

Insulin

IN SOME patients, the careful employment of insulin may be of some value since it will improve appetite and induce gain in weight in probably the majority of patients not extremely ill or moribund. Most observers used dosages of 15-60 units distributed throughout the day, with precaution against shock regarded as in diabetes.

Contra-indications include:

1. Laryngeal involvement when swallowing is painful.
2. Gastro-intestinal tuberculosis with diarrhea in which the increased food ingestion will aggravate the symptoms.
3. Extreme emaciation and exhaustion, when the patient needs help in feeding and is prone to develop severe reaction.

Cough

BANYAI and Cadden (1943) found the following benefits from the use of an inhalation mixture of 10% carbon dioxide and 90% oxygen:

1. Spells of strenuous exhausting coughing are prevented and thereby rest is secured for the patient and particularly for the lungs.
2. An unproductive cough is transformed into a useful one.
3. Directly after inhalation the amount of expectorated sputum is increased and its character changes from a heavy, thick and tenacious type into a thinner, serous and more watery kind.
4. The use of expectorant drugs and narcotics can be reduced.

Antibiotics

TUBERCULOSIS in human beings pursues an insidious course and often does not produce symptoms until irreversible destructive changes have occurred in tissues. The mechanical handicaps to healing thus brought about frequently require surgical correction. In such cases, no anti-bacterial preparation can replace surgical treatment. One may anticipate, however, that a bacteriostatic substance would widen the indications for surgical treatment if it suppressed the trend toward rekindling of the infection produced by surgical manipulation of tuberculosis tissues. The role of antibacterial drugs is that of blocking the paths for extension of the disease while the healing forces are operating.

Streptomycin inhibits the growth of mycobacterium tuberculosis IN VIVO, experimentally and clinically. It is recommended for more extensive trial in the treatment of many forms of pulmonary and extra-pulmonary tuberculosis because of definitely and consistently encouraging results attendant on its use in the past two years. Treatment with streptomycin requires large doses (1-3 gm. daily) for long periods and should not be undertaken unless adequate amounts are likely to be available to complete a course of at least two to four months' duration (up to 360 gm.).

Treatment with this antibiotic should be postponed or denied to those tuberculous patients who are making satisfactory progress and who are likely to achieve the arrest of their disease as a result of conventional therapeutic methods. Streptomycin is not to be regarded as a substitute for other and proved effective forms of treatment of tuberculosis.

Final judgment of streptomycin must await the trial of time.

Abstract Par Excellence

WORKMEN'S compensation in America is obsolescent; it must be replaced. An objective fact-finding board should be established to study every aspect of the problem nationally. The board should work closely with the states and assist them in effecting improved conditions.

—H. F. FLANDERS, M.D., in *Jackson County Med. Soc. Weekly Bull.*, abstracting "Occupational Incapacity," by BERT HANMAN, in INDUSTRIAL MEDICINE, October, 1948.

American Association of Railway Surgeons
— A Brief History —

Compiled by
ESTHER H. VINCENT

THE AMERICAN ASSOCIATION OF RAILWAY SURGEONS was conceived in the mind of ALBERTUS WARD RIDENOUR, versatile Ohio surgeon, city health officer of the town of Massillon, and surgeon for several railroads. In the fall of 1887, the Association of Surgeons of the Pennsylvania Railroad was meeting in Alliance, a small city in north-eastern Ohio, and it was there that the enthusiastic DR. RIDENOUR proposed that this Association (founded in 1882, and second oldest in the country) take the initiative in forming a national organization of railway surgeons.

LEANDER FIRESTONE, then president of the Pennsylvania's Association, appointed an organizing committee, and DR. CHRISTIAN BERRY STEMEN, editor of the *Fort Wayne Journal of the Medical Sciences*, and final chairman of the committee, gave notice in his journal that the May meeting of the Pennsylvania's surgeons at Fort Wayne, Indiana, would be open to all American railway surgeons for discussion of the proposed national organization.

On June 28, 1888, over 150 surgeons, representing over 60 different railroads, met at Chicago's Palmer House, to officiate at the birth of the National Association of Railway Surgeons. First president of the new-born society was JOHN WESLEY JACKSON, Chief Surgeon of the Wabash Railroad since 1885. As Chief Surgeon of the Missouri Pacific Railroad, DR. JACKSON had built up the first railway hospital system east of the Rocky Mountains. At the time of his death, in 1890, he was President of the Kansas City Medical School, and First Vice-President of the American Medical Association.

The National Association's first secretary was the literary DR. STEMEN, who even visited foreign parts in search of railway surgical association data. The first treasurer was the Ohio sanitary pioneer, ROBERT HARVEY REED, one-time Chief Surgeon of the Baltimore and Ohio Railroad, railway journal contributor, and indefatigable enthusiast of railway surgeon associations.

Fifteen scientific papers were read at this first meeting, and DR. STEMEN'S *Fort Wayne Journal* was made the official publication of the National Association. From September, 1888, to July, 1891, this journal was issued monthly as the *Journal of the National Association of Railway Surgeons*.

The second annual meeting, held in St. Louis, May 2-3, 1889, was attended by 500 surgeons. The Executive Committee, headed by DR. WARREN B. OUTTEN, Chief Surgeon of the Missouri Pacific Railroad, presented the first draft of the Constitution.

Kansas City, Missouri, was the scene of the third meeting, held May 1-3, 1890. DR. JAMES BISSETT MURDOCH presided, and certain revisions were made in the Constitution. It is interesting to note that the "Hospital Plan," discussed at this meeting, and already in effect on several railroads, is the forerunner of the modern industrial hospitalization insurance. So well attended was this meeting, about 600 surgeons being present, that it served as an incentive to other such associations, especially to those connected with the older trunk lines in the East.

The fourth meeting, held in Buffalo in the spring of 1891, under the presidency of DR. OUTTEN, produced the first volume of the Association's *Transactions*. In this issue is to be found DR. REED'S detailed *Historical Sketch of the Association* (Appendix B). The *Transactions* of the fifth (1892) and the sixth (1893) meetings appeared similarly, all three being published by the *Railway Age and Northwestern Railroader*, which, in 1891, superseded the *Fort Wayne Journal* as the Association's official publication. At the seventh annual meeting in Galveston, 1894, the Association decided to support a journal of its own, and the *Railway Surgeon* came into being on June 5, 1894, with DR. REED as editor. DR. REED'S editorship, however, was brief, since the National Association disapproved of his activities in behalf of the new American Academy of Railway Surgeons.

THE idea of an association with a limited number of members had been discussed by many prominent railway surgeons as early as May, 1892, and at the 1894 meeting of the National Association, the president, DR. S. S. THORNE, brought up the question of resolving the Association into a delegatory body. The railroads were objecting to providing free transportation to the hundreds of members and their female relatives, and serious surgeons were objecting to the hazy scientific work being done in an atmosphere of fun and frolic. SAMUEL CRAIG PLUMMER, Chief Surgeon of the Chicago, Rock Island and Pacific Railroad, approaching the Association with thoughts of membership, found that as a social body it was a huge success, but that some meetings were attended by nobody but the chairman and the speaker.

However, opposition to changing the nature of the Association was strong, and the motion was defeated. Whereupon a small body of men, devoted to surgery, and influential outside the field of railway service, founded the American Academy of Railway Surgeons, limiting membership to 200 active Fellows. Meetings were held in Chicago and the *Transactions* appeared in 10 volumes, 1894-1903, volumes 8-9, 1901-1902, however, being published in the *Railway Surgeon*.

Meanwhile, the National Association was incorporated in 1897 in Illinois, and, with extension of membership to Mexican and Canadian surgeons in 1898, became the International Association of Railway Surgeons.

THE two organizations finally got together at Chicago in June, 1904, and at a joint session formed the AMERICAN ASSOCIATION OF RAILWAY SURGEONS, with DR. JOHN E. OWENS, Chief Surgeon of the Illinois Central, as first president, and with DR. ALBERT I. BOUFFLEUR, of the Chicago, Milwaukee and St. Paul, as chairman of the Committee on the Constitution. The plan of organization was a modification of that of the American Medical Association, the branches being the organizations of the different railroads. Permanent membership in the central body was limited to 200, with the delegates having all the privileges of the permanent members except in the work of the executive sessions. Thus, the good features of both the International Association and the Academy were covered.

At the same time, the *Railway Surgeon* became the *Railway Surgical Journal,* continuing thus until August, 1921, when it became the *Surgical Journal,* with DR. LOUIS J. MITCHELL as editor.

The plan of adding outside talent to the list of speakers at meetings was happily inaugurated at the 1920 session, and at the 1921 meeting the custom of holding joint sessions with the surgeons' association of some particular railroad was begun with an invitation to the Surgical Association of the Chicago and North Western Railway.

With the September-October issue of 1929, the *Surgical Journal* merged with the *International Journal of Medicine and Surgery* to become the *International Journal of Medicine and Surgery and Surgical Journal,* and when that publication was acquired by and consolidated with INDUSTRIAL MEDICINE in August, 1935, the Association chose INDUSTRIAL MEDICINE as its official organ. The Association was then 48 years old, and was realizing that railway surgery, the oldest type of industrial surgery, had become an integral part of the wider field of industrial medicine.

In 1939 the Association celebrated its 50th birthday, planning its meeting as a fitting expression of the significant progress made in railway surgery during the half-century. To honor the occasion came the surgeons' associations of 19 railroads entering Chicago.

The time has long passed when the railway surgeon was looked upon as the man who wanted to cut off arms and legs for almost any kind of injury. As the individual physician had broadened his outlook, so his professional association has broadened its scope. Members of the AMERICAN ASSOCIATION OF RAILWAY SURGEONS include specialists in all phases of medical practice, for railway surgery is not a special kind of practice, but a special field for all kinds of medical knowledge.

American Asociation of Railway Surgeons
—Sixtieth Anniversary Meeting—
NOVEMBER 21-23, 1948—PALMER HOUSE, CHICAGO

Program

Sunday, November 21

ANURIA—DR. GEORGE H. EWELL, Urologist to the Jackson Clinic, Madison, Wisconsin.

"Hematuria"—DR. WILLIAM J. BAKER, Associate in Genito-Urinary Surgery, Northwestern University Medical School, Chicago, Illinois.

"Hypertension and Some of Its Complications"—DR. FRANCIS D. MURPHY, Consulting Internist, C.M. St.P.&P. Railroad, Milwaukee, Wisconsin.

"Surgery of Gastric Ulcer"—DR. WALTMAN WALTERS, Professor of Surgery, Mayo Foundation; District Surgeon, C.&N.W. Railway, Rochester, Minnesota.

Symposium—"Low Back Pain": Moderator—DR. JAMES E. M. THOMPSON, Surgeon, C.B.&Q. Railroad and C.R.I.&P. Railroad, Lincoln, Nebraska.

Medical Viewpoint: DR. LEROY SLOAN, Professor of Medicine, University of Illinois College of Medicine, Chicago, Illinois.

Psycho-somatic Viewpoint: DR. ALFRED P. SOLOMON, Senior Attending Neuro-psychiatrist, St. Luke's Hospital; Associate Clinical Professor of Psychiatry, University of Illinois College of Medicine, Chicago, Illinois.

X-ray Viewpoint: DR. JAMES T. CASE, Professor of Radiology and Head of Department, Northwestern University Medical School, Chicago, Illinois.

Neuro-surgical Viewpoint: DR. ERIC OLDBERG, Professor and Head, Department of Neurology and Neurological Surgery, University of Illinois College of Medicine; Consulting Neurological Surgeon, C.R.I.&P. Railroad and I.C. Railroad, Chicago, Illinois.

Orthopedic Viewpoint: DR. EDWIN W. RYERSON, Formerly Professor of Orthopedic Surgery, Northwestern University Medical School; Consulting Orthopedic Surgeon, C.R.I.&P. Railroad, Chicago, Illinois.

Monday, November 22

THE Medico-Legal Problem of Hernia"—DR. CHESTER C. GUY, Associate Clinical Professor of Surgery, University of Illinois College of Medicine; General Surgeon, I.C. Railroad, Chicago, Illinois.

"Psychoneurosis"—DR. RALPH C. HAMILL, Formerly Associate Professor of Nervous and Mental Diseases, Northwestern University Medical School; Professor Emeritus of Nervous and Mental Diseases

(Rush) University of Illinois College of Medicine; Consulting Neurologist, C.M.St.P.&P. Railroad, Chicago, Illinois.

"The Management of Burns—With Particular Reference to Local Care"—DR. MICHAEL L. MASON, Associate Professor of Surgery, Northwestern University Medical School; Consultant Surgeon, C.& N.W. Railway, Chicago, Illinois.

"The Causes of Persistence of Symptoms after Biliary Tract Surgery"—DR. CHARLES B. PUESTOW, Professor of Surgery, University of Illinois College of Medicine; Consultant Surgeon, C.M.St.P.&P. Railroad, Chicago, Illinois.

"Newer Developments in Anesthesia"—DR. W. ALLEN CONROY, Assistant Professor of Anesthesiology, University of Illinois College of Medicine; Director of Anesthesia, St. Luke's Hospital, Chicago, Illinois.

"A Few Practical Problems in Gynecology"—DR. GEORGE H. GARDNER, Professor and Chairman Department of Gynecology and Assistant Dean Northwestern University Medical School, Chicago, Illinois.

"Ptomaine Food-Poisoning a Myth"—DR. GAIL M. DACK, Director, Food Research Institute and Professor of Bacteriology, University of Chicago, Chicago, Illinois.

"The Management of the Obese Patient"—DR. M. DAVID ALLWEISS, Associate in Medicine, Northwestern University Medical School, Chicago, Illinois.

Annual Dinner—Monday Evening

MASTER of Ceremonies—DR. T. L. HANSEN.

Address: "Recent Observations of Medicine in Central Europe"—DR. JAMES E. M. THOMSON, President, AMERICAN ASSOCIATION OF RAILWAY SURGEONS.

Tuesday, November 23

OPHTHALMOLOGICAL Problems in Industrial and General Practice"—DR. JAMES W. CLARK, Ophthalmologist, C.R.I.&P. Railroad, Chicago, Illinois.

"Vertigo"—DR. ELMER W. HAGENS, Assistant Professor, Department of Otolaryngology, Northwestern University Medical School, Chicago, Illinois.

"Timing in The Repair of Facial Injuries"—DR. WAYNE B. SLAUGHTER, Chairman Department of Plastic Surgery, Stritch School of Medicine, Loyola University, Chicago, Illinois; Head of Department of Plastic Surgery, University of Wisconsin School of Medicine, Madison, Wisconsin.

"The Management and Prognosis of Closed Head Injuries"—DR. HAROLD C. VORIS, Clinical Professor of Surgery (Neurologic), Loyola University Medical School, Chicago, Illinois.

"The Injured Knee: The Negative X-Ray"—DR. JAMES K. STACK, Assistant Professor of Bone and Joint Surgery, Northwestern University Medical School; Consultant Surgeon, C.&N.W. Railway, C.B. &Q. Railroad, and C.R.I.&P. Railroad, Chicago, Illinois.

"Some Problems of Fractures of The Ankle"—DR. RAYMOND HOUSEHOLDER, Associate in Surgery, Northwestern University Medical School; Assistant Chief Surgeon, C.M.St.P.&P. Railroad, Chicago, Illinois.

"Surgery of the Heart and Great Vessels"—DR. CARL DAVIS, JR., Clinical Assistant in Surgery (Rush) University of Illinois College of Medicine, Chicago, Illinois.

"Problems in Varicose Vein Surgery"—DR. WALTER W. CARROLL, Associate in Surgery, Northwestern University Medical School, Chicago, Illinois.

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Convention Manager, Technical Exhibits.

All members of the medical profession are cordially invited to attend any or all of the sessions of the American Association of Railway Surgeons.

Papers are limited to 30 minutes with no discussion.

There is no registration fee.

NEWS, COMMENT, OPINION

Not to Blame

A READER nominates for "Gobbledygook-of-the-month" the following article title, which appeared recently in one of our leading medical journals: "Medicine's Responsibility in the Propagation of Poor Protoplasm." In case you're a bit dubious as to the author's meaning, our correspondent provides a plain-talk translation: "Don't Blame Doctors for the Draft Rejection Statistics."

—*Medical Economics*, October, 1948.

Causes of Most Absenteeism

THREE fifths of the absenteeism among manufacturing workers results from illness and accidents away from work, according to findings of a joint study conducted by the Bureau of Labor Statistics, the Social Security Administration and the U. S. Public Health Service. The survey covered 246 plants in 1947. The average employee lost 9.6 working days during the year, of which illness and non-industrial accidents accounted for 6.5 days, personal reasons 2.5 days and industrial injuries only 0.6 day. Seasonally, absenteeism rates were highest in the year's first quarter (when respiratory infections are at their height), declined substantially in the second, reached the lowest point in the third quarter and rose sharply in the fourth quarter.

—Washington Letter, *J.A.M.A.*, October 16, 1948.

Variation in Recreation

READING clubs, organized to give members a broad understanding of the classics, are finding a place in recreation programs of an increasing number of companies. Great Books Foundation, 58 E. South Water St., Chicago 1, Illinois, provides the books, leadership instruction, and promotional material for an annual fee of $9.60 a person. The year's course, covered in 18 biweekly meetings, ranges from Plato and Aristotle to Adam Smith and Marx. Through selected readings from classic philosophers and political economists, the program seeks to give a better understanding of our American economy. Leadership outlines are not slanted, and there is no flag waving. But sponsors of the program believe that study of all major philosophies bulwarks confidence in the democratic economy. Great Books Foundation, a non-profit organization, was founded by Lynn A. Williams, Jr., formerly vice-president of Stewart-Warner Corp., where one of the earliest clubs still functions. Chancellor Robert Maynard Hutchins of the University of Chicago heads its board of directors, composed of educators and industrialists. Members of groups range up to 40. Though chief appeal is to white-collar workers and supervisors (a number of sponsoring groups are foremen's clubs), production workers have shown a lively interest in the reading and discussions.

—Editorial, *Modern Industry*, September 15, 1948.

Cost of the Common Cold

AN ATTEMPT to arrive at a rough approximation of the cost to the American people of their common colds has been made by the statisticians of the Metropolitan Life Insurance Company (Cost of Common Cold. *Statist. Bull. Metrop. Life Insur. Co.* 28 (No. 11):6, 1947) who came up with the appalling figure of well over $1,000,000,000 a year. This figure was obtained by taking into account the data on incidence of the disease among wage earners, students and other special groups, according to the studies of many reliable investigators. The calculations ran somewhat as follows: The average person suffers at least two colds a year or approximately 300 million annually for the entire country. The average duration of the simple cold is five days, giving a total of one and a half billion days of discomfort, decreased efficiency or disability. A conservative estimate of the time lost from work in this country is one day per employee per year, or more than 60 million days lost in industry from this cause. Even at a low average of $7 a day, the result in wages alone is more than $420,000,000 annually. The amount spent on medical care and drugs for the treatment of colds by the average family is impossible to arrive at, but it was assumed to be about $10 a year, or a total of about $400,000,000. No attempt was made to estimate the cost to employers resulting from the loss of production and disrupted routine, but it, too, must reach a considerable figure for the country as a whole. These calculations led the Metropolitan's statisticians to arrive at the estimate of over $1,000,000,000 a year as the cost of the common cold to the American people. Although the common cold is generally considered to be a minor illness, they concluded that any disease in which the cost runs to such astronomical figures must be rated high in the list of enemies of the public health.

—Editorial, *New England Med. J.*, October 7, 1948.

Government Runaround

NO NEED to go abroad for examples of the stifling effects of government medicine, says Dr. Thomas S. Whitecloud, of Houston, Texas. Shaken by his experiences on the Blackfeet Indian Reservation in Montana, Dr. Whitecloud recently resigned, abandoning his plans for a career of service to Indians. Dr. Whitecloud was the only physician in a 45-bed hospital on the reservation. "But the hospital was run by a civil service nurse," he recently told *The Houston Press*. "I could make suggestions but I couldn't give orders. When it came to administration, she ranked me." Good medical care was also ranked—by a little black book. This volume, issued by the Indian Service to its physicians, contained a large number of ready-made diagnoses. Each case had to be charted to correspond to a numbered diagnosis. "If Joe Indian came in almost dead from virus pneumonia," said Dr. Whitecloud, "you had to number him with the code for lobar or lobular pneumonia, because the Government book didn't list the virus type. It didn't even list the common cold. You had to fit the patient to the book."

—*Medical Economics*, October, 1948.

A Happy Place to Work

UP TO NOW, we have measured our success as management men by such standards as salaries, cost and sales figures, and comforts and education for our families. We have applied much the same kind of standards in judging our companies and even the effect of our managerial efforts on the people who work for us. By such yardsticks, we have been enormously successful. We American executives

and everyone around us should be truly happy people. That is the way things *should* be. But the way they *are* is different. Even in this nation many of us are afflicted with discontent and unrest. The world is passing through the greatest era of social upheaval in all history. Obviously, something is wrong. What is it? The trouble doesn't lie in what we have accomplished. That is all to the good. But our great achievements have been material; and we are troubled because, in raising the material standard of living, we have overlooked the need to make equal progress in raising the psychological or spiritual standard of living. To get back on solid ground, we must change some of our yardsticks and methods. This is not just theory. The opportunity lies before us, here, right now. And some management men, out on the frontiers of industrial progress, are seizing it and getting results that prove conclusively they have uncovered two of the biggest industrial facts in this century or any other. Fact Number One is that, in a working world, the spiritual atmosphere at an indiviual's place of work can be the most important factor in forming his attitude toward society. By and large, the man who is happy in his work is the man who is at peace with the world. Fact Number Two is that this worker is a more productive worker. Plants where employees have high spiritual living standards are also plants where efficiency is high and costs are low. So a drive to lift such standards is a completely practical goal for the management men in every plant. The plant whose employees have high spiritual standards pays wages in job satisfaction, as well as money. That is the big difference. The worker in this plant knows what he is doing, and why. He feels that he "belongs," that he is a full-fledged member of a team that has definite and worthwhile goals. He gets a real sense of achievement from his work. And he has solid respect for himself and his job, because he knows he has earned it and those around him show it by their words and actions. This worker gets satisfaction from his job for just one reason: Because the men who manage his plant have made it possible for him to do so. They have provided him with material help in the form of modern equipment, sound methods, and good working conditions. But they have also provided him with such unmaterial but even more important help as trained leadership; information about his job and company; a voice for grievances; a channel for ideas; a way to have a say on decisions that involve his welfare. Among still other items, they have a consideration that makes it clear he is regarded as a human being whose good will is worth cultivating and whose opinion deserves respect. In recent years, a handful of typical plants have deliberately built this attitude. If they can do it, then thousands of others can. And if they do, we're heading for better days than any of us have yet seen.

—Editorial, *Modern Industry*, September 15, 1948.

When Plant Is Too Hot

DR. THOMAS BEDFORD, of the Industrial Health Research Board in England, reported at the conference on Human Factors in Industry of the British Association for the Advancement of Science held in Leamington, England, that "you can work better in winter than in summer. If the place where you work is too hot you will be less efficient and in greater danger of accidents." Dr. Bedford cited as an example a study of conditions in coal mines which showed that the summer's output was 13% less than in winter. In an experiment designed to test the capacity for mental performance under high temperatures, telegraph operators were set to recording messages. As the temperature rose from 75 to 95 dgrees and the humidity increased, the number of mistakes per hour jumped nearly eight-fold. Besides affecting efficiency, high temperatures also increase the number of accidents in a factory or shop. Accidents appear to be least frequent at temperatures from 65 to 69 degrees. When the temperature rises above 75 degrees, accident frequency rises by 32 to 35%. A report on the number of accidents in coal mines showed that at temperatures below 70, young people are more likely to incur accidents than older ones with a minimum of accidents between the ages of 30 and 39. At temperatures over 80 this trend is reversed, although 30 to 39 was still the safest age range. The effect of high humidity, although not measured as exactly as that of high temperature, also proved to be decreased production.

—Science News, in *Toledo Blade*, September 26, 1948.

Puzzle! Where is the $9,000,000,000!

SOME figures recently called to our attention by the Council on Medical Service of The American Medical Association are peculiarly interesting. In the last 11 years, a total of $10,200,800,000 has been paid into the so-called Social Security funds, and $849,000,000 has been collected in interest. Benefits paid have totaled $1,689,600,000, and administration has cost $246,000,000. In spite of the size of these figures, simple arithmetic shows the remining kitty is more than $9,000,000,000! Puzzle: Find the $9,000,000,000—where do you suppose it is? Perhaps being used to run other government departments? Or just socked perhaps in the general treasury? Or does it have something mysterious to do with the present inflationary cycle? Don't ask us. We are just simple medical editors and haven't even a nodding acquaintance with government fiscal experts. Being of a curious nature, however, we wonder if the same sort of figures wouldn't apply to health funds if ever Ewing and the Social Security crowd got control of medicine through a compulsory sickness insurance tax. Perhaps you wonder also. Perhaps you think it worthwhile to ask the same question to your patients, your civic leaders, your political representatives. We wonder.

—*Rocky Mountain Med. J.*, 45:467, 1948.

New Graduate School of Public Health

THE UNIVERSITY of Pittsburgh announces a $13,600,000 gift from the A. W. Mellon Educational and Charitable Trust for a new Graduate School of Public Health. DR. THOMAS PARRAN, former Surgeon General of the U. S. Public Health Service, has been named as the first Dean of the new school and as consultant to the Chancellor on the medical sciences. He will assume his new position immediately. The purposes of the school will be to train physicians and other scientific leaders for work in public and industrial health, and to conduct basic research in the prevention of disease and the lengthening of life. The new school will be part of the University's Medical Center and will "emphasize occupational and industrial hygiene; health generally connected with, or related to, Pittsburgh and similar urban industrial areas; and research in

health problems." It is hoped that in this field of industrial health the school can establish world leadership. But in industry, with official public health departments and voluntary agencies, the new school at Pitt will find special opportunities for sound development. The school will prepare students to receive the M.P.H. (Master of Public Health) and D.P.H. (Doctor of Public Health) degrees. Both degrees are post-graduate to degrees in medicine, dentistry, sanitary engineering, nursing, bacteriology, and allied sciences. The school will be the first post-graduate school in the medical sciences at the University of Pittsburgh. There are 10 other similar institutions in the United States and Canada. Those are at Harvard, Yale, Columbia, Johns Hopkins, University of North Carolina, University of Michigan, University of Minnesota, Tulane, University of California, and University of Toronto. The school would stimulate undergraduate medical education in preventive medicine and serve as a center for planning the training of public health personnel. On an advanced level, it would devote special attention to the key posts in public health and industry which set the pattern of professional quality for all the work that is done. Standards will be high. An average student at similar institutions elsewhere has had several years of practice in either medicine or public health before he takes his work in the graduate school. Because of the quality of the teachers and the students, these schools have become important centers of research. It was pointed out that at Johns Hopkins and Harvard, for example, the research budgets exceed the teaching budget two to one. It is hoped to have the new school begin operation in the fall of 1949. The emphasis will be placed on an outstanding program.

Medicine and Its Relation to Accident Prevention

STANLEY came to this country about 30 years ago. He didn't bring his wife with him and, because he lived with other "Poles" in a foreign community, he didn't learn English very rapidly. After five years of hard work, he had become a crane operator in a steel mill and was making enough money so that he went back to Poland and returned with his wife. The crane he operated was a large one; in fact, one of three in a pretty good-sized steel mill. He had to climb a ladder to get to his crane, and, once he was in the cage, he operated the crane single-handed. Everything went along all right year after year until he was about 57 years of age, and then, at a periodic examination, it was discovered that his blood pressure was increasing. Further increases were noted at each of the next three annual examinations, and at the last one, his pressure was found to be 280/140. It had been difficult for the doctors to explain to him the necessity of reducing his weight and taking other measures to keep his blood pressure in check, and now that his pressure had reached such an extreme height, it did not seem safe to permit him to continue climbing the ladder to his crane and operating it alone all day. The doctors were unable to persuade him that it was for his own good, as well as the good of other workmen in the mill, that he be assigned to light duties in a safe place on the ground. He was so displeased with this decision that he appealed at once to the union and every effort was made to have him readjusted to work on the ground, but he had learned only to operate the crane, and in spite of the fact that he would have been paid the same, he could not make up his mind to take other work. Before the question had been definitely settled, he had a stroke and died the next day. The moral of this story is obvious, that periodic examinations every year prevented Stanley from having a severe accident which would have involved not only himself and his crane, but possibly many men under him, and might even have tied up the third of the steel mill dependent on his crane during critical war years.

E. F. was not so fortunate. He was only 28, and on coming to work he had intentionally failed to state that he was under constant treatment for a severe diabetes. One morning he had come to work with insufficient breakfast, and before noon his blood sugar had dropped to such a low point that he fell over in an insulin coma right in front of a shop truck. His right thigh was torn open and fractured and because of his severe diabetes, healing was more difficult and prolonged than usual. In this case the urinalysis and better pre-employment examination, with sufficient time spent on it to let the doctor gain his confidence, would have brought out the story of his diabetes and he could have been protected from his insulin shock and accident.

J. F. S. had worked as an inspector for 18 years, building up an excellent reputation. One day he crushed a finger in such a manner that the accident looked intentional, for it could hardly have happened otherwise. Finally, after much discussion among the safety engineers, it was decided to send him for a physical check-up because he certainly had not injured his finger intentionally and the accident could not have happened to a seeing man in any other way. He avoided going to the doctors for three weeks on one pretext after another; finally, an examination showed him to be almost completely blind. Fellow workers had been assisting him in and out of the plant, as well as helping him cover up at his work. A check made then on the parts he had been inspecting revealed a previously unexplainable cause for numerous complaints on the finished product. In this case, periodic examinations would have revealed the man's failing vision and he could have been taught to work safely on another more suitable job.

R. S. F. WAS a nervous, fast molder, who had won the respect of his bosses and the envy of his fellow workmen by the amount of work he turned out. His piecework earnings topped the earnings of all other molders in the foundry, regularly, by 20 to 25%. This went on for nearly four years, then one day he stumbled and fell as he was carrying a pail of kerosene across the foundry floor. A fire occurred at once an he was badly burned. At the hospital it was discovered that his heart was decompensated, and his story later confirmed the heart condition, for during his convalescense he stated definitely that when he had fallen with the pail of kerosene that day it was because of sheer exhaustion.

WILL F. LYON, M.D., International Harvester Co., Chicago, in National Safety Council News Letter.

This man had not had any pre-employment examination which, if a chest x-ray had been taken, would have revealed his damaged heart.

S. E. F. HAD had a regular pre-employment examination 20 years ago when he came to work and had never been sick a day since. His job as assistant production manager took him through the mill frequently, and several of his associates had noticed gradual changes in his mental attitude and gait, but they had never gotten together to pool their information, so nothing was said or done. One day the lights in a department through which he was passing suddenly went off for a few minutes, and he immediately fell into a machine and was rather badly injured. While he was in the hospital, it was discovered that he had a tertiary syphilitic infection involving the central nervous system so that it was necessary for him to use his eyes in walking. If he had had a routine blood test at the time of his employment and at periodic intervals through the years, this condition could have been detected earlier and arrested before it had reached the point of disabling him.

THESE brief case histories merely illustrate what everyone knows, namely, that an individual who is sick for any reason cannot be a safe workman. The onset of some illnesses is so insidious that they are hardly detected before the effects are serious and, fortunately, many of these can now be rather easily and quickly discovered in pre-employment and annual periodic examinations. These examinations, of course, must include a short but intelligent history, the usual physical check-up, chest x-ray, blood pressure estimation, urinalysis and blood serology.

BOOKS

Clinical Toxicology

CLINICAL TOXICOLOGY: By CLINTON H. THIENES, M.D., PH.D., and THOMAS J. HALEY, PH.D., 2nd Edition, published by Lea and Febiger, Washington Square, Philadelphia 6.

THIS book is divided into nine sections, six dealing with poisons from the standpoint of their physiological action such as convulsants; central nervous depressants; peripheral, acting on nerve trunks, ganglia and nerve endings; muscle poisons; protoplasmic poisons; poisons of the blood and hematopoietic organs. Section VII deals with principles of treatment; Section VIII is an outline of symptoms diagnosis, and Section IX covers chemical diagnosis of poisoning, with an appendix on Special Reagents.

The textbook is well written. It is primarily a classroom text and a guide for the general practitioner. The action of a particular poison is not covered under one heading; the student is required to turn to several sections to get the complete physiologic picture, which is objectionable. The poisons described in the text are those which most frequently give rise to distressing symptoms or cause death or serve to typify a group of poisons. Closely related poisons are discussed under one heading. Poisoning by absinthe is so rare in occurrence, I cannot see why the authors give it two pages. The tests, described would necessitate access to a well equipped chemical laboratory which the medical practitioner seldom possesses or has the ability to make. The treatment is discussed as simply as possible, yet to include several approved methods, at least one of which should be available to the physician. The method of treatment of cyanide is not the most modern and should be changed in future editions. When hydrocyanic acid has been inhaled accidentally or when cyanides have been taken into the stomach, antidotes such as potassium permanganate and thiosulphate are too slow to be effective. The authors should have given under treatment immediate inhalation of AMYL nitrate. Glass "pearls" of amyl nitrate, nearly always found in the emergency kit of the physician, can be crushed into a handkerchief which is held over the patient's face, while preparations for other treatment are being instituted. The physician can advise over the telephone the administration of hydrogen peroxide, a common household remedy, until he arrives.

The book, is valuable for the medical student and the general practitioner, since the authors have simplified the text by eliminating the chemistry, pharmacy, or general pharmacology except where essential to the understanding of the action of the poison.

—WM. D. MCNALLY, M.D.

Economic Poisons

CONFERENCE on Economic Poisons held on July 12, 1948, at Berkeley, California:

At this conference, called by the Bureau of Adult Health, interested agencies discussed the pharmacology, toxicology, legal aspects and preventive measures to be applied in the use of economic poisons. The development of DDT marked the beginning of a new era in the use of insecticides in agriculture. With the rapid introduction of synthetic organic pesticides, there has not been sufficient toxicologic study to offer sufficient controls. Under the title of economic poisons are included, insecticides, fungicides, rodenticides, fumigants, weed-killers and plant hormones.

A group of such compounds, known as the organic phosphates has appeared, and because of their toxicity they present a particularly dangerous health hazard.

There are 80,000 kinds of insects in North America, at least 5,000 of which are known to be of economic importance. The estimated damage to food products caused by insects annually in the U. S. is two billion dollars.

The chemical contamination of foods with residues, the effects of inhalation and skin absorption of the new pesticides must be studied before their indiscriminate use. There is very little information on the chronic toxicity to man of most of the newer insecticides.

The general consensus of the assembled experts was: (1) Much more factual information than is available at the present time is needed in order to evaluate these materials. (2) It is most desirable for the several agencies to exchange information that accrues to them from time to time. (3) Education of manufacturers and users, the medical profession, and the general public regarding some of the potential dangers of insecticides and other economic poisons is necessary. (4) There is a need for a central laboratory to test these compounds for toxicity before they are widely distributed commercially.

—WM. D. MCNALLY, M.D.

ASSOCIATION NEWS

WE RECEIVED a detailed report of the excellent Fifth Annual Meeting of the TERRITORIAL ASSOCIATION OF PLANTATION PHYSICIANS, which was held September 3 and 4, in conjunction with the Fourth Congress of the Pan-Pacific Surgical Association in Honolulu. The Friday evening joint meeting presented the following speakers and subjects:

DR. WALTER STUCK: "The Treatment of Acute Fractures."

DR. GERALD BROWN O'CONNOR: "The Treatment of Acute Facial Injuries."

DR. C. E. FRONK: "The Plantation Physician and His Community."

DR. L. HOLLAND WHITNEY, formerly Medical Director, Sperry Gyroscope Company, on Long Island, has been appointed Medical Director of the New Jersey Bell Telephone Company, with his office at 540 Broad Street, Newark 1, New Jersey.

Certification

ON SATURDAY morning, October 16, 1948, an important and history making meeting was held in the Association offices at 28 East Jackson Boulevard, Chicago. This meeting was called by the cooperating committees on certification of the American Medical Association and the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS to discuss the formation of an American Board of Occupational Medicine. Those present and the organizations represented were as follows:

DR. CARL M. PETERSON, member, AMA Committee on Certification of Oecupational Medicine.

DR. WILLIAM A. SAWYER, member, AMA Committee on Certification of Occupational Medicine.

DR. HAROLD A. VONACHEN, member AAIP&S Committee on Certification.

DR. F. W. SLOBE, member, AAIP&S Committee on Certification.

DR. E. C. HOLMBLAD, member, AAIP&C Committee on Certification.

DR. OSCAR A. SANDER, chairman, AMA Section on Preventive and Industrial Medicine and Public Health.

DR. T. LYLE HAZLETT, representing University of Pittsburgh.

DR. FRANK PRINCI, representing the University of Colorado.

DR. ANTHONY J. LANZA, representing New York University.

DR. LEONARD J. GOLDWATER, representing Columbia University.

DR. WILLIAM ASHE representing University of Cincinnati.

DR. J. WISTER MEIGS, representing Yale University.

DR. W. R. WILLARD, representing Yale University.

DR. A. O. SEELER, representing Harvard University.

DR. RAYMOND HUSSEY, representing Wayne University.

DR. EARL F. LUTZ, AAIP&S Committee on Certification.

DR. ERNEST BROWN, representing AMA Council on Industrial Health.

DR. JAMES M. CARLISLE, representing American Academy of Occupational Medicine.

DR. ADOLPH G. KAMMER, AAIP&S Committee on Certification.

THIS group entered into a most interesting and enlightening discussion of the desirability of forming a Certification Board in this field. The problem of graduate training in industrial medicine as given now at the various medical schools and the schools of public health was presented. There was some discussion of the undergraduate training and other courses that are now being offered in many of the medical schools. It was recognized that the post-graduate training would involve a period of basic training followed by courses in specialized subjects in the field of occupational medicine. These would cover the first 12 to 18 months. The latter part of this training would be the actual practical application of this knowledge in plants with adequate and comprehensive medical departments. There will of necessity have to be some method of appraising these plant medical departments for competent training facilities. Just as the hospital administrator must get his practical training in a hospital, so must the industrial physician get his practical training in the plant. No other place will afford a better opportunity to examine, diagnose, evaluate and treat the medical problems of the industrial workers than the plant. The special industrial medical problems, such as industrial injuries and occupational diseases, will not be found in number or variety in the medical school clinics, or dispensaries, or even in the teaching hospitals affiliated with medical schools.

After the luncheon recess there was a unanimous vote to proceed with the establishment of a Certifying Board in Industrial Medicine or Occupational Health.

The recommended methods for the formation of the Certifying Board suggested by the Advisory Board to the Medical Specialties were presented and discussed. It was voted to authorize the two cooperating committees on certification of the American Medical Association and the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, with an additional representative of the American Academy of Occupational Health, to proceed with the incorporation of such a Board. An amendment was passed to include in this group one or more representatives of the group that is now doing the teaching and giving the courses in the specialty field of occupational medicine.

It is most gratifying to all interested in occupational medicine and certification, to know that these physicians coming from all parts of the country would make this trip and give of their time, knowledge and experience to aid in the training and recognition of the work of physicians in industry. There will be a stenotyped transcript of the entire meeting discussion. The expenses of the meeting were shared by the American Medical Association and the American Foundation of Occupational Medicine, a trust of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS. And so another milestone of progress has been passed.

Board of Directors Meeting

THE FALL meeting of the Board was held in the AAIP&S Association Offices, Sunday, October 17, 1948. Those in attendance were: Officers: HAROLD A. VONACHEN, A. H. WHITTAKER, E. H. CARLETON, A. G. KAMMER, F. W. SLOBE, E. C. HOLMBLAD.

Directors: L. R. DANIELS, R. M. GRAHAM, E. A. IRVIN, F. E. POOLE, J. M. CARLISLE,

EARL F. LUTZ, GEORGE F. WILKINS.

District Counsellor: H. GLENN GARDINER.

Chairmen of Committees: CARL T. OLSON, C. RICHARD WALMER, T. LYLE HAZLETT, FREDERICK SHILLITO.

The reports of officers were presented and approved. The Association directory is in press, and it is hoped that it will be mailed in the next few weeks. It was recommended that representatives of this Association be asked to present the importance of adequate teaching facilities in occupational medicine to the Association of American Medical Schools. Honorary members, fellows, active members and associate members were elected. There was discussion about changing some of the qualifications for various types of membership, this matter to be presented at the next Board of Directors meeting and also at the next Annual Meeting. The change in name suggestions were discussed and referred to the Public Relations Committee for further study and recommendation. The report of the American Foundation of Occupational Health was presented and accepted. District Council reports were presented. There was considerable discussion relative to the Toronto 1950 Convention, and the Executive Committee was authorized to plan the 1950 Convention after conferring with the other participating groups. The reports of other committees were presented, discussed and accepted. Gratifying progress was reported in the planning of the Detroit 1949 Convention. Special Convention Committees are working on their respective activities and the new type of section meeting will be an interesting innovation. There will be plant visits, and plans are under way for trips and entertainment for our wives and lady guests. All of the participating groups will have a joint meeting followed by a fellowship hour. Hotel reservations should be made promptly.

During this meeting the group stood for a minute of silent prayer for our recently departed DIRECTOR EDWARD P. HELLER. A committee was appointed to draft and present appropriate resolutions.

Indications are that the next Board of Directors meeting will be called the middle or latter part of January, 1949.

DR. FREDERICK BRYAN WISHARD passed away very suddenly, September 23, 1948, as a result of coronary heart disease. This tragic news came like a thunderbolt to a committee gathering of 25 physicians at the Detroit Athletic Club, planning the program for the April, 1949, Annual Meeting. He was born August 24, 1894, in Teheran, his parents being Presbyterian missionaries. He received his B.S. degree at Wooster College of Medicine, 1923. He interned at the Methodist Hospital, Indianapolis, 1923 and 1924. He has been Medical Director of the Delco-Remy Division of General Motors Corporation at Anderson, Indiana, and associated with that division for 24 years. He has maintained an outstanding interest in industrial medicine, frequently presenting scientific papers and addresses on subjects in the field. He is nationally known for his interest in chest radiography and its great value in industrial medicine. He designed procedures that made it possible not only to have pre-placement chest radiography but also to expedite this work so the applicant was able to see the x-ray study of his chest during or at the end of his pre-placement examination. In such ways the prestige and value of the plant medical services were emphasized by early indoctrination. We all share in the loss of FRED WISHARD and will miss his dynamic and forceful personality.

1949 Conference, Detroit

THE 34th Annual Meeting and INDUSTRIAL HEALTH CONFERENCE, sponsored by the AAIP&S in conjunction with four other participating organizations, will be held in Detroit, Michigan, April 2-8, 1949, with headquarters at the Book-Cadillac and Statler Hotels.

The dates of the meetings for the various participating groups are as follows:

April 2-5, 1949, AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS.

April 5-8, 1949, AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS.

April 5-7, 1949, AMERICAN INDUSTRIAL HYGIENE ASSOCIATION.

April 6-7, 1949, AMERICAN ASSOCIATION OF INDUSTRIAL DENTISTS.

April 5-9, 1949, AMERICAN ASSOCIATION OF INDUSTRIAL NURSES.

INDUSTRIAL MEDICINE

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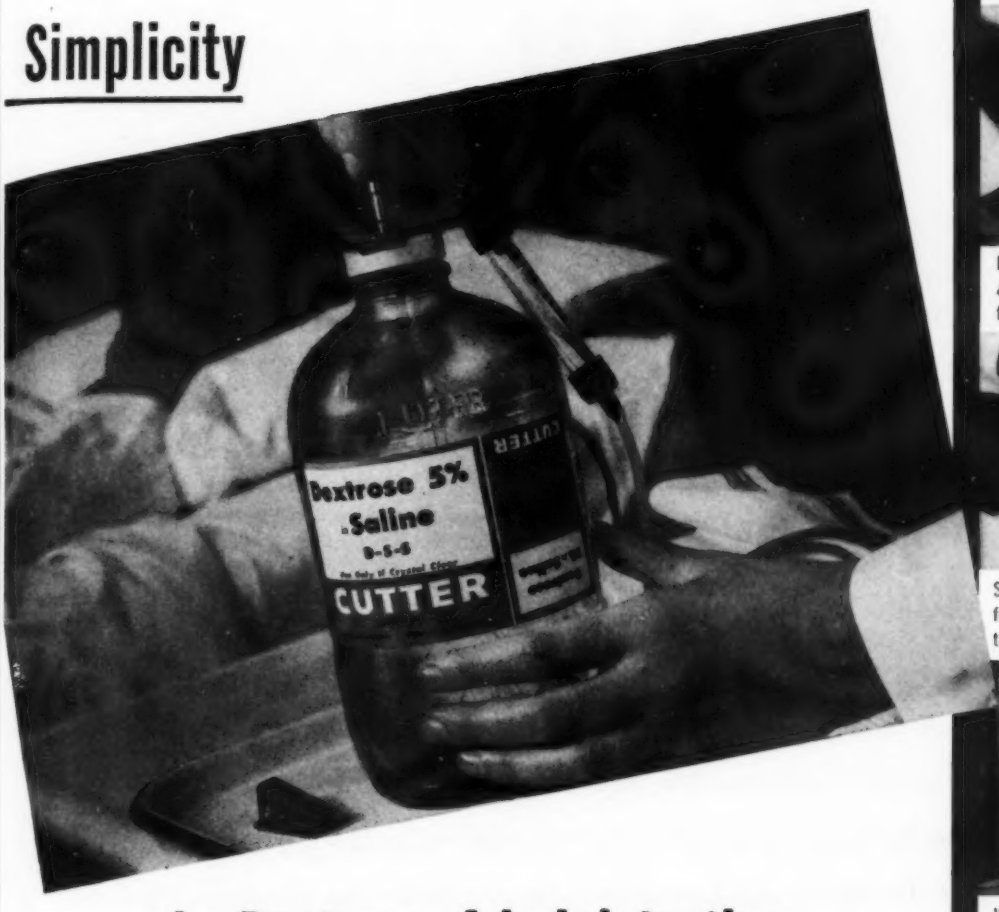
Where Is the Nine Billion?

OVER a year ago, in an editorial, "Who Comes Courting" (in INDUSTRIAL MEDICINE, June, 1947), we said: "It is not suspicion, therefore, but only simple logic, that foresees the marshalling of all of WHO'S forces toward the fixation of socialized medicine upon the American people. The effort will begin with propaganda. . . ." The effort has begun, but it is much more subtle than propaganda—coming as it does, through the U.N. commission on human rights, by way of a so-called "international bill of rights." Regarding this, the president of the American Bar Association recently warned that this proposed "bill of rights" constitutes an agreement "to adopt the New Deal on an international scale by committing the member nations to a paternalistic form of government which would attempt to care for all the daily needs of the citizen and minimize the incentive for individual initiative and progress." In proof, he cited the statement of the director of the U.N. division that the commission was looking toward "intervention, revolutionary in character, within the domestic jurisdiction of member states." Thus, "it is the duty of the state to undertake full employment. . . .; provide protection for wage earners and dependents against lack of income for reasons beyond their control, and assure adequate food, housing, and community services necessary to the well-being of the people." This, of course, is aimed at the United States. There were patriotic "Minute Men" involved in getting the Bill of Rights into our Constitution. Maybe it's time to start a new organization of "Minute Men" to keep it there. Meanwhile, someone might answer the question on page 455: "Where is the Nine Billion?" It was set up as a *trust fund* for "protection" of wage earners. Imagine a great insurance company with a similar large fund collected from its policyholders, having spent the fund, leaving instead its own I.O.U.'s which could only be paid through collecting enough more from policyholders to pay them. How quickly the D.A. would cry "Fraud." The suggested new "Minute Men" might look into the real whereabouts of the nine billion—soon, before there's any chance of a vastly larger fund under socialized medicine.

Attitudes on Education

INTERESTING in this issue are certain expressions of the professional attitude toward industrial medical education from four different countries. The first is the report of progress toward certification in the United States, in the "Association News" (page 458): "It was recognized that the post-graduate training would involve a period of basic training followed by courses in specialized subjects in the field of occupational medicine. The latter part of this training would be the actual practical application of this knowledge in plants with adequate and comprehensive medical departments." The second is the recommendation of the First Argentine Congress of Industrial Medicine (page 438) for "the creation, in the medical faculties, of Institutes of Industrial Medicine." The third is the mention by DR. PILGRIM (page 26) of the letter from Italy in a recent *J.A.M.A.:* "the Association for Legal and Occupational Medicine approving an order that. . . .at the great universities, schools for specialists in occupational medicine should be instituted, and hygiene should become an obligatory branch of study at the industrial and technical intermediate schools." And the fourth is by way of the news item on page 21, "The Socialist 'Good Doctor.'" "Lord Morgan, president of the Royal College of Physicians. . . .disagreed with the theory that medical training in Britain should be reorganized to train industrial physicians, and declared it was the purpose of medical training simply to turn out 'good' doctors." No comment is necessary—except possibly a reminder to the Hon. president by way of the line in Hamlet: "goodness, growing to a pleurisy, dies of its own too much." *Sic semper* Socialism!

Simplicity



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INDUSTRIAL HEALTH and DISEASE

ON THE average, doctors have hiked their office call fees 37% during the last 10 years. In that same period, the general cost of living has increased nearly twice as much—67%.

—*Medical Economics.*

ACCORDING to a New York State nutrition survey, most men industrial workers have all the protein they need daily, while less than half of the women do.

—*Morristown, N. J., Record,* September 13, 1948.

THE President's industrial safety conference has set out to determine how many industrial accidents may be caused by inadequate diet or unhappy home life among the nation's workers. The 400 conference delegates authorized the research committee to study the physical, psychological, personal hygiene and work characteristics of factory employees that might contribute to or cause mishaps.

AN INDUSTRIAL Health Committee, to study health of industrial workers, has been organized by the Wayne County TB and Health Society....The Society reported x-ray surveys have revealed that chest abnormalities among industrial workers run about 50% higher than the general population.

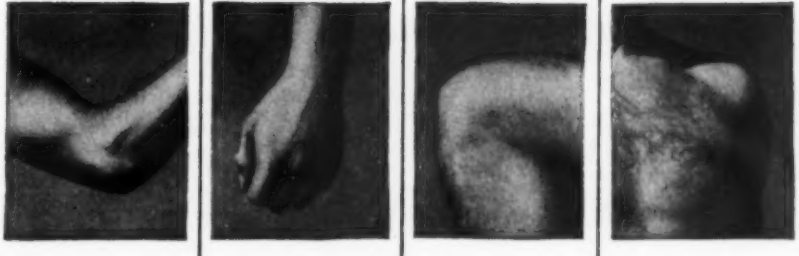
—*Detroit Free Press,* September 20, 1948.

A SEMINAR on industrial medicine and surgery attended by many leading industrial medical men throughout New York and the Toronto, Canada, area, was held at Hotel Statler, Buffalo, October 7 and 8. This was the twelfth in a series of medical meetings sponsored throughout the country by the American Mutual Liability Insurance Company of Boston, for the purpose of disseminating information on advanced practices in the care and treatment of occupational diseases and injuries. DR. HENRY C. MARBLE, of Boston, surgical director of American Mutual and Consulting Surgeon for the Massachusetts General Hospital, conducted a program on physical medicine and rehabilitation; DR. FRANK POTTS, Professor of Orthopedic Surgery, University of Buffalo School of Medicine, discussed the problem of low back pain; DR. J. SUTTON REGAN, Assistant Professor of Surgery, University of Buffalo School of Medicine, lectured on the treatment of chronic leg ulcers; DR. DAVID K. MILLER, Buffalo, Professor of Medicine, University of Buffalo School of Medicine, discussed the modern use of antibiotics.

The Socialist "Good" Doctors

A NATIONAL industrial medical service designed to extend industrial medical care to all British workers is a definite project of the British government, Minister of Labor George Isaacs told the opening session of the Ninth

Beyond the reach of human fingers



Beneficial effects may be exerted, not just locally but systemically, "beyond the reach of human fingers" in such conditions as arthritis, myositis, muscle sprains, bursitis and arthralgia. That systemic as well as local effects may be achieved by such preparations as Baume Bengué was conclusively demonstrated by the fundamental work of Moncorps, Kionka, Hanzlik, Brown and Scott.

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International Congress on Industrial Medicine at London. An estimated 1,000 specialists from 46 nations assembled for the first time in 10 years to consider various aspects of industrial medicine and to hear technical papers dealing with industrial medical research in 23 nations. Lord Morgan, president of the Royal College of Physicians, told delegates in his opening address that presently fewer than half of the British workers have medical supervision at their work. One of the problems before the congress, he stressed, is how to bring the doctor in industry into small factories where he is so greatly needed. He disagreed with the theory that medical training in Britain should be reorganized to train industrial physicians, and declared it was the purpose of medical training simply to turn out "good" doctors. The need for an introduction of courses in normal psychology into medical training programs, he warned, is still generally unrecognized.

—*Chattanooga, Tenn., Times*, September 14, 1948, quoting *New York Times*

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Occupational Diseases

GETTING out a newspaper at any time of the year is apt to be a hazardous occupation, fraught with unexpected perversities, and productive of such bodily disorders as ulcers, shingles and nervous breakdowns. It remained for the past few weeks, however, to set an all-time low in this respect for this particular newspaper. The Fates have been bearing down on us with the full force of their furies in the last fortnight and we're ready to cry "Uncle!", throw in the towel or perform any other sacrificial rite that will placate our tormentors. First and foremost on our plague list is the racket created by multiple hammers beating on multiple boards, the din of sharp-edged chisels grinding out chunks of stone and the cacophony of razor-toothed saws filing and rasping their way through countless pieces of lumber. That discord of sound stems from the work that has been going on preparatory to *The Sunday News* occupying its enlarged quarters on Oak Street. Superimpose on this din a chorus swelled by the metallic clacking of linotype machines, the sturdy roar of giant presses and the other hullaballoo and havoc that go into the making of a newspaper, and you have a slight (but only a slight) idea of what we were up against. Then, too, there was the business of manhole covers acting like tiddly-winks over in the next block, and the fire in the bakery around the corner which brought fire engines a-screaming and hundreds of people a-running and a-yelling. Despite all this we could still have managed an Aldershotian stiff upper lip if it had not been for the dozens of puns confected by spectators at the bakery fire. To repeat them would be to offend our readers and encourage the perpetrators. Autumn will probably bring cooling surcease and gentle quiet to our pounding noggins. Meanwhile, please pass the aspirin.

—*Ridgewood, N. J., News*, September 5, 1948.

1949 Detroit Conference
April 2-8, 1949.

Expanding

EVIDENCE that the scope of company medical services has "expanded widely" during the last few years is contained in a survey of industrial health and medical programs released over the week-end by the National Industrial Conference Board. Pre-placement physical examinations for hourly workers are required by more than 90% of the establishments which were surveyed. Examinations are also compulsory for office workers in 76.9% of the 333 companies studied; for supervisors in 74.8% and for executives in 58.9%. Both large and small companies provide pre-placement and periodic physical examinations and counseling services for supervisors and executives. In most cases, all the examinations are provided without cost to members of the two groups. Many of the smaller companies utilize the part-time services of physicians, visiting nurse services and community facilities to provide their employees with many of the health services available in larger companies. Industrial hygiene programs are maintained by 47.4% of the cooperating establishments, it was found. Many health problems, occupational diseases and hazards are reported as being decreased through the analysis and control of working conditions and environments, such as fumes, lighting, dust, sanitation and temperature. Health education programs also are being used by many of the companies surveyed "to keep employees and their families informed on current health data," the board said. Employee publications, health bulletins, posters, motion pictures and personal interviews are some of the media reported being used for the purpose.

—*New York Times*, September 7, 1948.

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Silicosis Hope

MUCH has been done to clarify the pathology of silicosis, a respiratory disease which afflicts about 500,000 workers in the dusty trades and in which large portions of the lungs are blocked by fibrous tissue, but far less to understand the respiratory physiology. Since tuberculosis is the usual end result of silicosis a fundamental large-scale study has long been overdue. With a grant of $575,000 from the Anthracite Health and Welfare Fund of the United Mine Workers of America, the Jefferson Medical College Hospital of Philadelphia embarked on a five-year research project which was to answer questions that have long baffled the physiologists. What is involved physiologically, and what is the relation of lungs and heart in silicosis? How and why are the movements of lungs and diaphragm affected? Why is it that x-rays often fail to reveal the cause of shortness of breath in advanced cases? Is it possible after the facts have been unearthed to improve the affected parts? Such questions can be answered only if silicosis can be studied in hundreds of cases in all stages. The United Mine Workers was able to furnish enough human material in the

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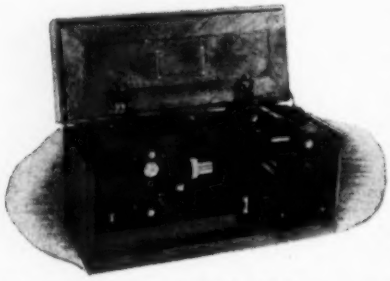

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form of 500 volunteers who needed attention as well as the money for research. After only a year's work some 500 silicotics feel better because they have inhaled mists of neosynephrine and isuprel through an ingenious double-acting valve devised by Jefferson clinicians. In such respiratory afflictions as pneumonia, bronchitis, lung abscesses and infective bronchial asthma it is easy enough to breathe a medicated mist, but in silicosis the lungs cannot be adequately inflated and deflated because of those blocking fibrous masses. The double-acting valve makes it possible to pump oxygen into the lungs and suck out the carbon dioxide that cannot be exhaled. To the United Mine Workers of America goes the credit for having made this real progress in combating silicosis—thanks to payments by mine operators into a medical fund of 10 cents on each ton of coal mined, a tax to be doubled. Though the coal-consuming public now pays the bill for research and for the medical care of sick miners, it probably gets more for its money in the form of good medicine than if miners had to rely on governmental support. Industry and labor ought to engage in more scientific cooperation of the kind that the U.M.W.A. have brought about, not that it will solve the medical problem presented in ordinary times by the indigent sick but that it can keep within bounds a heavy tax bill if and when compulsory health insurance is introduced.
—*N. Y .Times*, Sept. 28, 1948.

Foundation Meeting

WITH the theme of the meeting — "Health at Work," the 13th Annual conclave of the Industrial Hygiene Foundation is being held at the Mellon Institute, Pittsburgh, November 18, 1948. The Keynote address on "Good Health is Good Business" is to be given by Dr. Thomas Parran, Dean of the new Graduate School of Public Health, University of Pittsburgh.

Health Information

SOCONY-VACUUM Oil Co., Inc., 26 Broadway, New York 4, N.Y., has packaged into a compact booklet "Preserve Your Health," a series of articles on home and industrial health problems prepared by DR. A. E. HOAG, company medical director. The book goes far beyond advice on industrial ailments, safety, and an explanation of the company's medical plan. It's chockful of

sound counsel for the worker and members of his family on tuberculosis, appendicitis, the common cold, athlete's foot, and the like — a handy, good-will-winning booklet to have at home.

—From *Modern Industry.*

DR. PILGRIM

ENROUTE to New York City to the 34th annual meeting of the International Association of Industrial Accident Boards and Commissions, and, at the Commodore during the meetings, seeing many of the group including MARY DONLON, the President, DR. D. J. GALBRAITH, Past-President, MRS. EMMA TOUSSANT, and MARSHALL DAWSON; and then to luncheon and a long discussion with DRS. LANZA and HUSSEY, and HENRY SAYER, on various types of medicolegal problems; and in the evening to DUDLEY BRITTON'S for preprandial libations, and later to the annual dinner with DRS. HUSSEY, PETERSON and others, seeing DR. SAM PECK, JOHN IDLER, and R. A. HOWE; and enjoying much the exceptional address of DR. HOWARD A. RUSK on his experiences in rehabilitation and physical medicine, supplemented by actual clinical examples in person; and next day to hear DR. PAUL REZNIKOFF concerning the important subject "Blood Dyscrasia Produced by Industrial Exposures," after not having seen PAUL for many years; and to luncheon with WAYNE MERRICK, BILL NICKELS, VOYTA WRABETZ, and DRS. HUSSEY and PETERSON, with HENRY SAYER; and meeting also DRS. MELVILLE MANSON and WILLIAM SAWYER; and on taking the train, seeing ELFREDA and MANFRED BOWDITCH, and having dinner on board with MANFRED, with the discussion of many new things and old problems. . . .AND presiding at the first meeting of the season of the Chicago Section of the AMERICAN INDUSTRIAL HYGIENE ASSOCIATION, at which HARRY GRAGG spoke well on "Some Practical Aspects of Industrial Dust Control"; and, meantime, concerned with various editorial problems, and also meeting BILL HOLLOWAY, GEORGE LULL, FRED DICKINSON and TOM HENDRICKS . . . .AND back at the first rehearsal of the season with the Chicago Business Men's Symphony Orchestra, and enjoying indeed the hearty welcome after being away for so long, and in the interim seeing LUCILLE COL-

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LINS off to California. . . .AND enroute to western Kentucky, by train, bus and finally automobile to destination, where was an inspection of plant and mine; and enjoying the quietude of a small town and quarters in a private house, with the next several days devoted to sampling and collection of various types of material for later analyses; and especially enjoying the dinner at the home of JACK DRENAN, a former associate in another mine investigation. . . .AND routine laboratory work on types of air and material samples, and in between reading excerpts from Dr. Norman Vincent Peale's recent book "A Guide to Confident Living," finding many illustrations of interest and practical value; and seeing a rather humorous short article in *Stanford Alumni Review* for September, which reminded of the the old saying "What's in a Name?"—the theme of the Summer Quarter at Stanford being "The Issues of One World: America's Responsibilities," the Dean of Students, Lawrence A. Kimpton ('31), noting as only coincidence that the following students had registered: Richard BERLIN of Palo Alto; Robert M. FUHRER, of Burbank; George A. GROMEEKO of Redwood City; Clifford GOEHRING of Lodi; and Russel Charles GOEBEL of Ashland, Oregon. . . .AND reading also in a recent issue of *J.A.M.A.* in the letter from Italy about

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the Association for Legal and Occupational Medicine approving an order that occupational medicine should be included as an obligatory branch of study in the last biennium at the medical faculty; that at the great universities, schools for specialists in occupational medicine should be instituted, and hygiene should become an obligatory branch of study at the industrial and technical intermediate schools. . . .AND after discussion with various representatives, proceeding for an inspection to a local industrial group and study of an occupational problem with reference to the use of storage batteries in the manufacture of radio equipment, in the meantime, celebrating the natal day rather quietly with music, friends and one candle on a cake, with the usual assortment of cards, telephone messages and telegrams. . . .AND going over various types of manuscripts and material, including some on ophthalmological problems, and then concerned with publicity stunts and photographs with regard to the orchestra; and reading about recent advances in science, including aureomycin and its great potentialities; the different types of rubber now used in almost indestructible tires; and the possibility of science being a campaign issue through revival of the arguments for the National Science Foundation. . . .AND attending the scientific meeting of the CHICAGO SOCIETY OF INDUSTRIAL MEDICINE AND SURGERY at which was a forum discussion of "The Malingerer," the members of the panel, DRS. VLADIMIR G. URSE, HARRY A. OBERHELMAN, EDWARD C. HOLMBLAD, RICHARD A. PERRITT and MR. HERBERT J. ENGEL, all acquitting themselves well in brief contributions, with PRESIDENT FELIX JANSEY as moderator; and here seeing many others, including DRS. WALKER, DRUECK, HUBATA, HAMMOND, VALENTINE, and representatives of the insurance groups . . . .AND now particularly concerned with certain phases of workmen's compensation problems and endeavoring to reach conclusions on the relative importance of each. . . .AND attending the first meeting of the Medical Advisory Committee to the Chicago Industrial Health Association relative to a series of radio broadcasts, here meeting DRS. HUTTON, SLIGHT, SLOBE, KRAUSE, LEVINE, MISS FOX, and BEN PARK, with the discussion of many phases and contingencies *in re* scenarios, recordings and broadcastings. . . .AND now preparations for sojourns in Ohio and Indiana of which more later.

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Advertisers Index

Abbott Laboratories 12
Aloe, A. S. Company 36
American Sterilizer Co. 39
Bard-Parker Co., Inc. 40
Bauer & Black 38
Bausch & Lomb Optical Co. 37
Becton Dickinson & Co. . . . 42
Bilhuber-Knoll Corp. 34
Bristol-Myers Company 20
Cambridge Instrument Co. 24
Camp, S. H. & Co. 43
Carbisulphoil Company 26
Cereal Institute 44
Ciba Pharmaceutical . . . . . 4th cover
Commercial Solvents Corp. 30, 31
Cutter Laboratories 17
Dazor Manufacturing Co. . . 41
Denver Chemical Mfg. Co., Inc. 42
Desitin Chemical Company 22
Dome Chemicals, Inc. 23
Eaton Laboratories, Inc. . . . . 2nd cover
Gebauer Chemical Co. . . . 28
General Bandages, Inc. . . . 28
Johnson & Johnson 1, 35
Keystone View Company . . 26
Leeming, Thomas & Co., Inc. 21
Lilly, Eli & Co. 16
Merck & Co., Inc. 29
New York Pharmaceutical Company 26
Occy Crystine Laboratory . . 34
Parke-Davis & Co. 11
Philip Morris & Co., Ltd., Inc. 46
Sanitary Soap Company . . . 25
Schenley Laboratories, Inc. 2, 5
Shield Laboratories 47
Smith, Kline & French Laboratories 33
Squibb, E. R. & Sons 9
Standard Pharmaceutical Company 26
Strong Cobb & Company . . 13
Sugar Beet Products 7
Vodine Company 38
West Disinfecting Co. . . . . 3rd cover
Whittier Laboratories . . 18, 19
Willson Products, Inc. 27
Winthrop-Stearns, Inc. 14
Wyeth, Inc. 15, 32, 45

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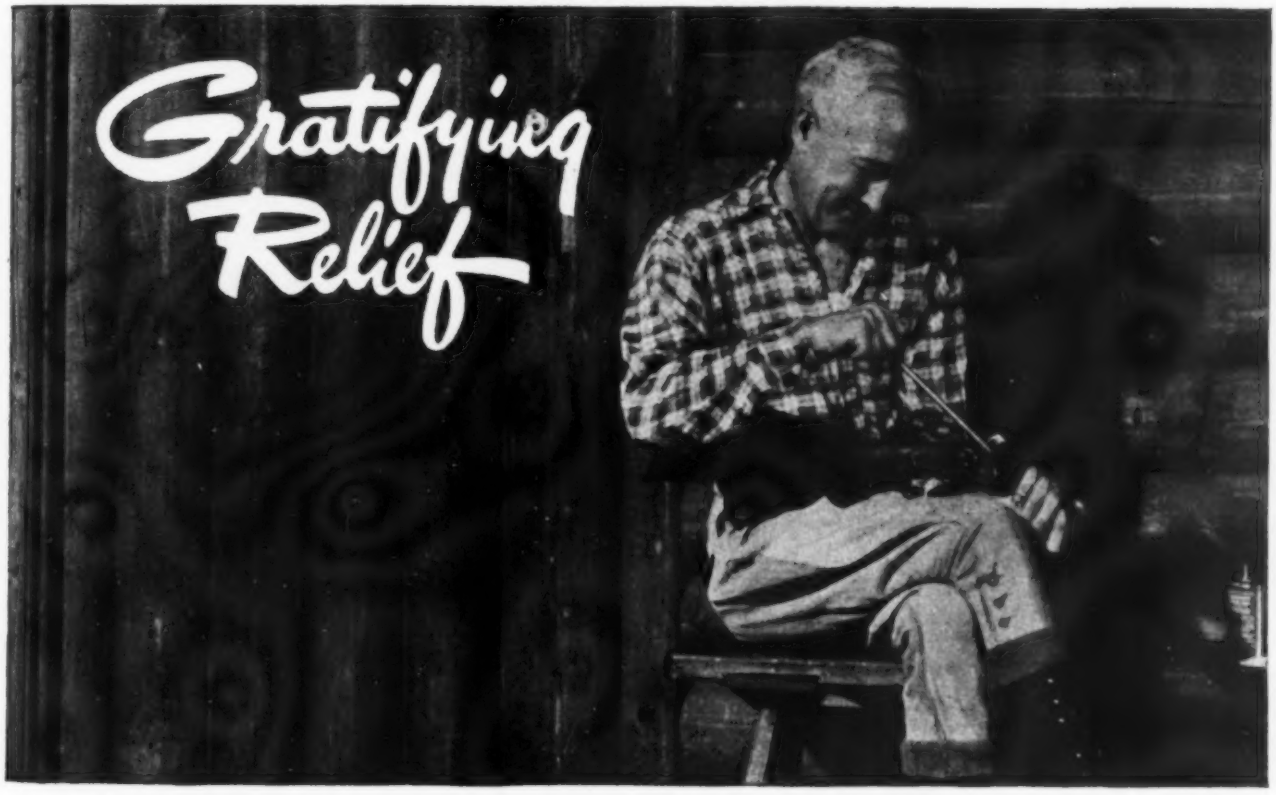

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Bacitracin, the newest antibiotic available for clinical use, affords a potent weapon for the treatment of many pyogenic infections of the skin and superficial eye infections. Available in dry powder form for preparation of solutions for local instillation and irrigation, as an ointment for cutaneous application, and as an ophthalmic ointment, it offers the following important advantages:

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Bacitracin is supplied in 20 cc. rubber-stoppered vials containing 2,000 and 10,000 units, and in 50 cc. rubber-stoppered vials of 50,000 units; Bacitracin Ophthalmic Ointment-C.S.C. is available in ⅛ ounce tubes; Bacitracin Ointment-C.S.C. (for cutaneous application), in ½ ounce tubes. Both ointments provide 500 units of Bacitracin per gram. Literature available to physicians on request.

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1. Criep, Leo H., and Aaron, Theodore H., *Neohetramine: An Experimental and Clinical Evaluation in Allergic States*, The Journal of Allergy, Vol. 19, No. 4, pp. 215-224, July, 1948.

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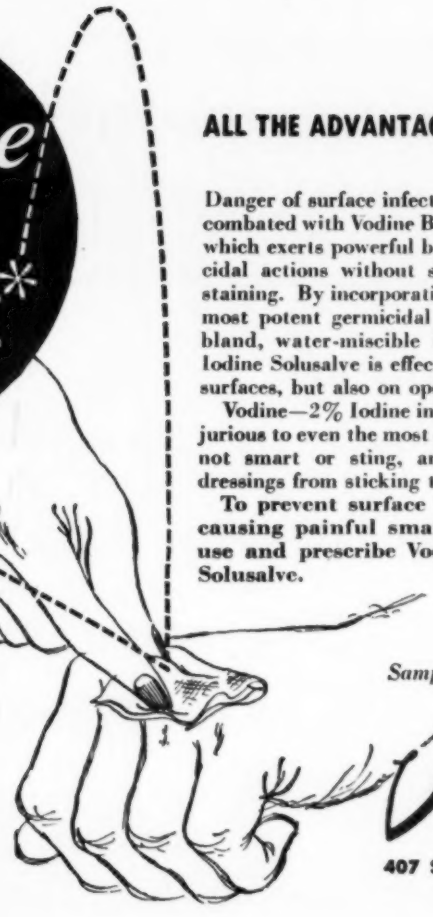

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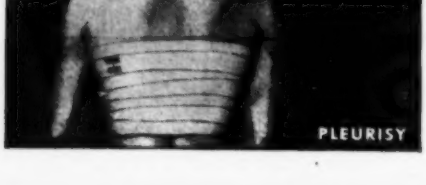

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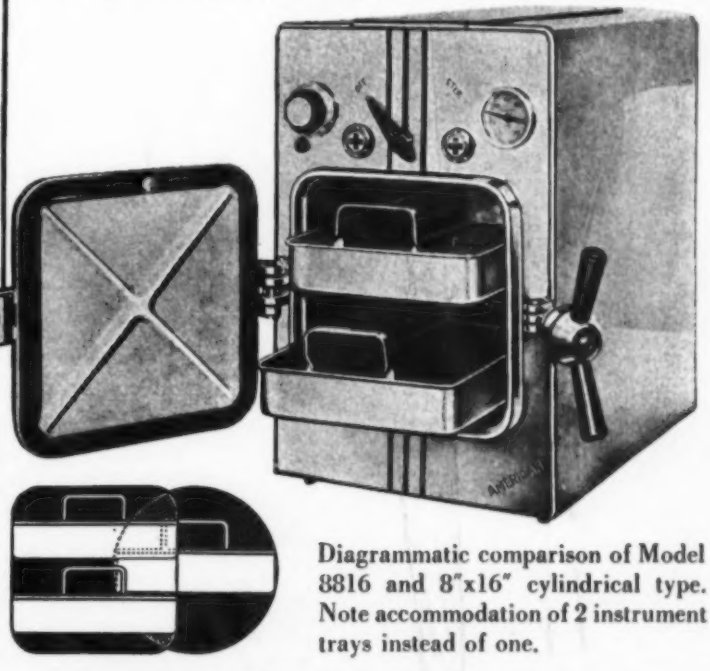
Presents a radical departure in autoclave design that meets every requirement wherever a single, pressure steam sterilizer of small size is indicated. Duplicates in every respect the efficient, precision performance of standard size "American" Surgical Supply Sterilizers widely used in hospitals.

SPACIOUS, DOUBLE-CABINET MODEL DB-16 is ideally constructed to accommodate MODEL 8816, thus combining the essentials of a practical Surgical Supply for the private office.



Diagrammatic comparison of Model 8816 and 8"x16" cylindrical type. Note accommodation of 2 instrument trays instead of one.

Brings Hospital Sterilizing Efficiency to the PROFESSIONAL OFFICE LABORATORY • CLINIC

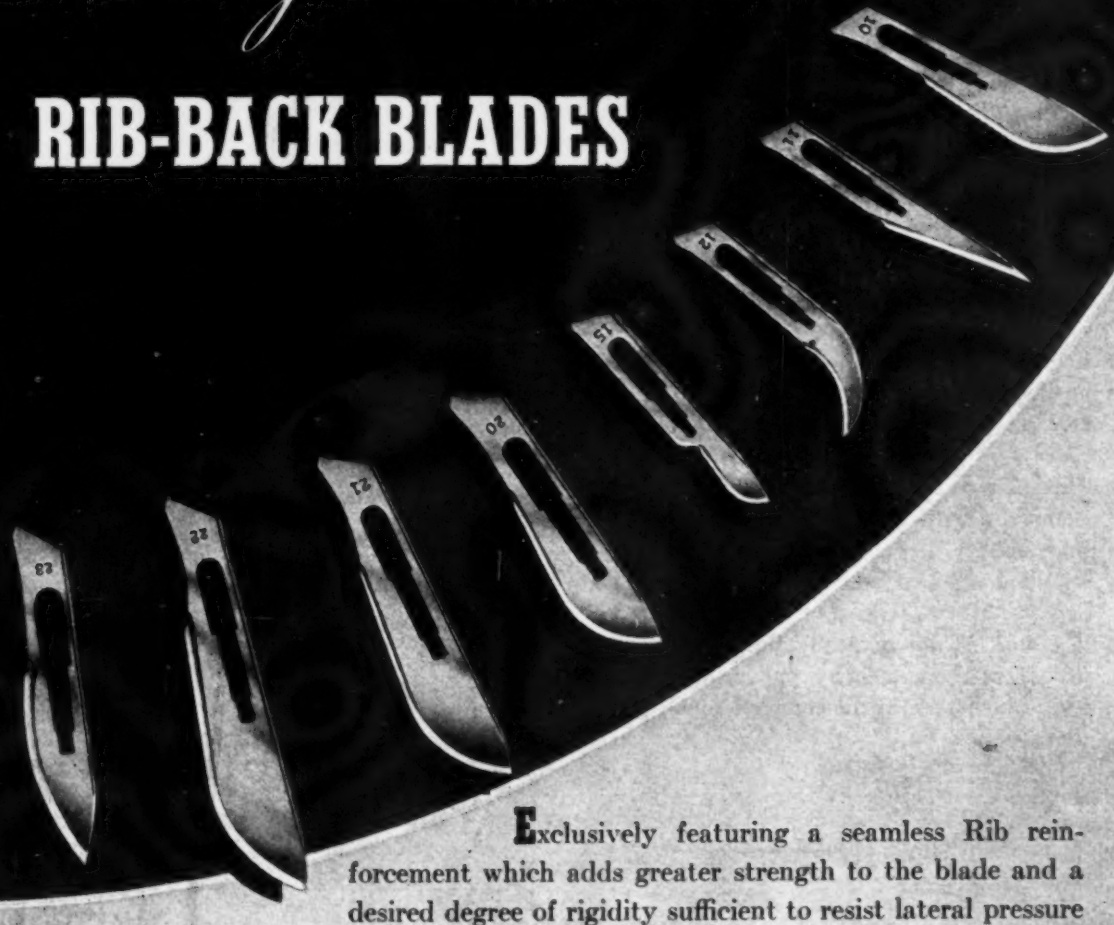
WRITE TODAY for complete information

AMERICAN STERILIZER COMPANY

Erie, Pennsylvania

The Edge on them all . . .

RIB-BACK BLADES



Exclusively featuring a seamless Rib reinforcement which adds greater strength to the blade and a desired degree of rigidity sufficient to resist lateral pressure . . . a manipulative aid to the surgeon in the entire surgical category.

Of greater import,—uniform cutting superiority . . . symmetry in precisioned steel. Superior sharpness, the progeny of ingenious fabrication methods and inspection control which created a new standard of surgical blade performance that serves the surgeon to even greater advantage. In Rib-Back Blades a more dependable cutting edge was born . . . the edge on them all.

Ask your dealer

BARD-PARKER COMPANY, INC.

DANBURY, CONNECTICUT

A BARD-PARKER PRODUCT

DAZOR FLOATING MAGNIFIER
A SEEING INSTRUMENT
FOR THE MEDICAL PROFESSION

Sharp, clear magnification . . . soft, cool fluorescent lighting . . . both combined in a professional seeing instrument you can *float* into position with a touch of your hand—that is a description of the Dazor *Floating* Magnifier. You can raise, lower, push or pull the magnifier head, swing it completely around, tilt or turn it at any angle. Wherever moved, it *stays put* without locking—held firmly by the patented Dazor *Floating* Arm.

Industrial first aid departments, hospitals and medical laboratories will have frequent occasion to use this flexible sight-booster. So, too, will dermatologists and oculists. Physicians will find it helpful in suturing, in removing deeply embedded splinters, in oral or throat work, and in various other local examinations and treatments.

For other office uses, where good lighting alone will suffice, consider the Dazor *Floating* Lamp. Its efficiency, flexibility and ease of operation have made it a favorite in the medical field.

If your supplier hasn't stocked Dazor *Floating* Magnifiers and Dazor *Floating* Lamps, ask him to order them for you. For the nearest Dazor distributor's name—if unknown to your supplier—have him write Dazor Manufacturing Corp., 4481-87 Duncan Ave., St. Louis 10, Mo. *In Canada* address inquiries to Amalgamated Electric Corporation Limited, Toronto 6, Ontario.

MOVES FREELY INTO ANY POSITION AND STAYS PUT—*WITHOUT LOCKING*

CHOICE OF 2 BASES

UNIVERSAL

With this combination base the magnifier may be clamped or screwed to any surface—horizontal, sloping or vertical.

PEDESTAL

Available in a portable floor-type unit (with pedestal base) for first aid rooms, hospitals, physicians, oculists, etc.

DAZOR FLOATING MAGNIFIER
WITH FLUORESCENT LIGHTING

An interesting new development in inunction therapy

Because of the constant demand for an external preparation that can be safely used as a "home remedy," we have developed A-535 Rub.

A-535 Rub is intended for the symptomatic relief of those conditions for which external analgesics and counter-irritants are commonly used. A-535 contains a combination of analgesics with a high percentage of methyl-salicylate in a new type of greaseless, stainless, vanishing base, which permits ease of application and almost instant utilization of the medications.

Because home remedies are used generally, we believe the manufacturer has a dual responsibility. He must offer only such products which may safely be used in the average household and must inform the medical profession of the product's ingredients and action.

The formula of A-535 Rub is

Methyl-Salicylate	12%
Oil of Eucalyptus	½%
Menthol	1%
Camphor	1%
Base (specially prepared)	85½%

A-535 Rub has been thoroughly tested both clinically and in over 6,000 homes. If you would like a tube of A-535, just drop us a line.

THE DENVER CHEMICAL MANUFACTURING COMPANY, Inc.

163 Varick Street New York 13, N. Y.

Hypodermic Needles ACE Bandages
Hypodermic Syringes Diagnostic Equipment
Fever Thermometers

B-D PRODUCTS
Made for the Profession

BECTON, DICKINSON & CO.
RUTHERFORD, N. J.

STATEMENT of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, as amended by the Acts of March 3, 1933, and July 2, 1946, of Industrial Medicine, published monthly at Chicago, Ill., for October 1, 1948. State of Illinois, County of Cook.—ss: Before me, a notary public in and for the State and county aforesaid, personally appeared A. D. Cloud, who, having been duly sworn according to law, deposes and says that he is the Publisher of the Industrial Medicine and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily, weekly, semiweekly or triweekly newspaper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the act of August 4, 1912, as amended by the acts of March 3, 1933, and July 2, 1946 (section 537, Postal Laws and Regulations), to wit: (1) That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, A. D. Cloud, 605 N. Michigan, Chicago, Illinois; Editor, C. O. Sappington, M.D., 330 S. Wells, Chicago, Illinois; Managing editor, None; Business manager, Stephen G. Halos, 605 N. Michigan, Chicago, Illinois. (2) That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addesses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Alice Finch Drueck, 4840 S. Greenwood, Chicago, Illinois; Charles Drueck III, 4840 S. Greenwood, Chicago, Illinois. (3) That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None. (4) That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. (5) That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is.... (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.) A. D. Cloud, Publisher. Sworn to and subscribed before me this 1st day of October, 1948. (Seal) Lucille H. Gross, (My commission expires February 14, 1951.) Note.—This statement must be made in duplicate and both copies delivered by the publisher to the postmaster, who shall send one copy to the Third Assistant Postmaster General, Division of Newspaper and Periodical Mail, Washington 25, D. C., and retain the other in the files of the post office. The publisher must publish a copy of this statement in the second issue printed next after its filing.

CAMP ANATOMICAL SUPPORT FOR FAULTY BODY MECHANICS

PATIENT OF THIN TYPE OF BUILD—
SKELETON INDRAWN

In conditions of faulty body mechanics, the nonuse of the abdominal muscles allows the pelvis to rotate downward and forward, bringing the sacrum up and back. There results an increased forward lumbar curve with the articular facets of the lumbar spine crowded together in the back.

The dorsal spine curves backward with compression of the dorsal intervertebral discs and the cervical spine curves forward with the articular facets in this region closer together. Therefore, chronic strain of the muscles, ligaments and joints of the spine and pelvis occurs.

Camp Anatomical Supports have an adjustment by means of which their lower sections can be evenly and accurately brought about the major portion of the bony pelvis. When the pelvis is thus steadied, the patient can contract the abdominal muscles with ease and then with slight movement straighten the upper back.

Relieving back strain and fatigue due to faulty body mechanics is a feature of the Camp Support illustrated and other types for Prenatal, Postnatal, Postoperative, Pendulous Abdomen, Visceroptosis, Nephroptosis, Hernia and Orthopedic conditions.

S. H. CAMP AND COMPANY • JACKSON, MICHIGAN

World's Largest Manufacturers of Scientific Supports

Offices in New York • Chicago • Windsor, Ontario • London, England

In Nutrition Rehabilitation... A Good Start

Any sound nutrition rehabilitation program starts with an adequate breakfast. Important as is an adequate breakfast in normalcy, doubly so is its importance in convalescence when reconstruction of body tissues and functioning hinges largely on nutrition. During recovery periods from disease, it is virtually mandatory that the dietary burden of the day be equally distributed over the three meals, hence breakfast becomes especially an important meal. Overtaxing the patient's digestive capacity is thereby avoided; an even flow of essential nutrients is made available for supporting the metabolic processes of rehabilitation.

As a means of assuring breakfast adequacy, a widely endorsed basic breakfast pattern is used. Consisting of fruit, cereal, milk, bread and butter, it forms a sound foundation upon which to plan the morning meal. Other suitable foods can be added if required by the situation at hand.

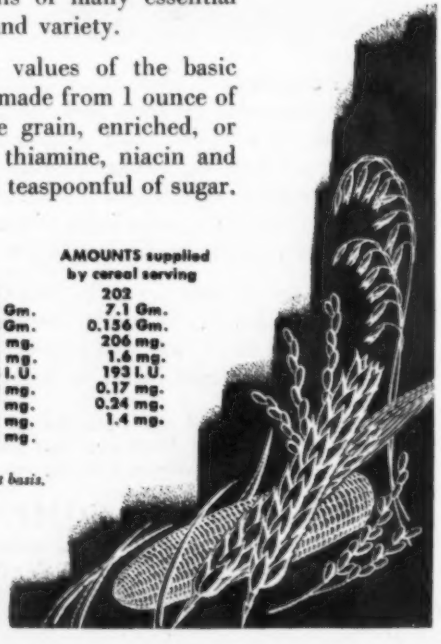
Because of its many nutritional and dietetic values, the cereal serving—hot or ready-to-eat breakfast cereal, milk, and sugar—is extensively recommended as the principal dish of this basic breakfast pattern. This cereal serving, rarely contraindicated and widely applicable, lends itself especially for use in rehabilitation dietaries. It provides, along with significant contributions of many essential nutrients, appetizing tastefulness and variety.

The table depicts the nutrient values of the basic breakfast and of the cereal serving made from 1 ounce of ready-to-eat or hot cereal* (whole grain, enriched, or restored to whole grain values of thiamine, niacin and iron), 4 fluid ounces of milk, and 1 teaspoonful of sugar.

The presence of this seal indicates that all nutritional statements in this advertisement have been found acceptable by the Council on Foods and Nutrition of the American Medical Association.

BASIC BREAKFAST	TOTALS supplied by Basic Breakfast	AMOUNTS supplied by cereal serving
Orange juice, 4 fl. oz.)		
Ready-to-eat or Hot Cereal, 1 oz.;	CALORIES..... 611	202
Whole Milk, 4 fl. oz.)	PROTEIN..... 20.7 Gm.	7.1 Gm.
Sugar, 1 teaspoon;	CALCIUM.....0.465 Gm.	0.156 Gm.
Toast (enriched, white), 2 slices;	PHOSPHORUS .... 488 mg.	206 mg.
Butter, 5 Gm. (about 1 teaspoon);	IRON ..... 3 mg.	1.6 mg.
Whole Milk, 8 fl. oz	VITAMIN A ..... 1074 I. U.	193 I. U.
	THIAMINE..... 0.52 mg.	0.17 mg.
	RIBOFLAVIN..... 0.87 mg.	0.24 mg.
	NIACIN..... 2.3 mg.	1.4 mg.
	ASCORBIC ACID .. 64.8 mg.	

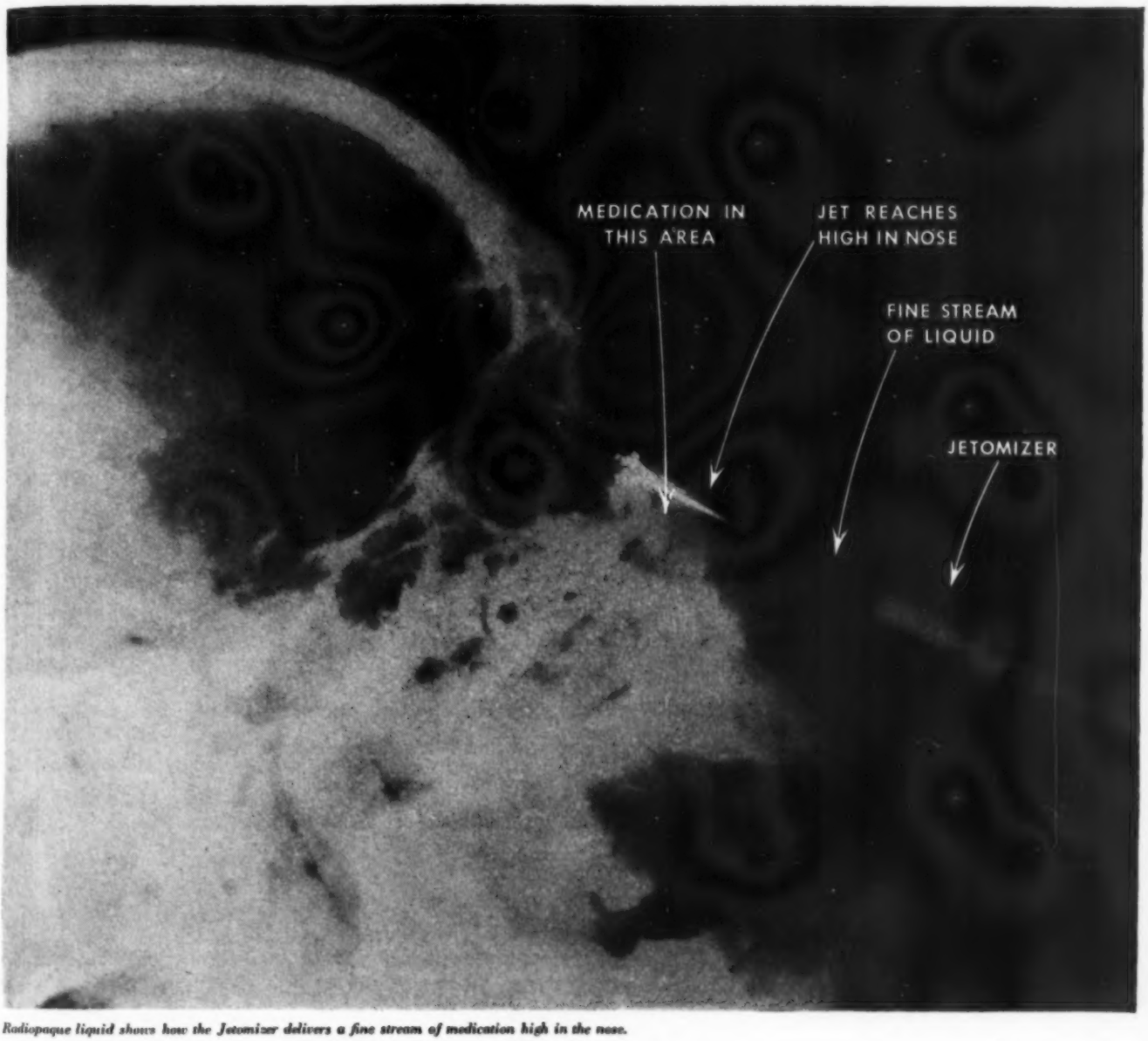
**Composite average of all breakfast cereals on dry weight basis.*



CEREAL INSTITUTE, INC.

A research and educational endeavor devoted to the betterment of national nutrition.

135 South La Salle Street • Chicago 3



Radiopaque liquid shows how the Jetomizer delivers a fine stream of medication high in the nose.

Because this jet goes high in the nose

And because it delivers a *uniform* dose —2½ minims . . .

And because it won't injure delicate tissue . . .

And because it protects the medication from contamination . . .

And because it's easy to use—reclining position unnecessary . . .

. . . This new Jetomizer is much more effective than droppers or sprays in the treatment of upper respiratory infections. If you haven't received a Jetomizer for personal use, write us.

Wyeth Incorporated, Philadelphia 3, Pa.

Jetomizer®

— for more effective nasal medication

Wyeth®

THIS SUGGESTION MAY BE OF VALUE FOR YOUR THROAT PATIENTS:

When cigarette smoking is a factor in throat irritation, many leading nose and throat specialists suggest* to their patients a choice of 3 alternatives:

1. Stop Smoking,
2. Smoke less,
3. *Change to* Philip Morris!

• Philip Morris is the *only* cigarette proved definitely and measurably less irritating!** Perhaps you too will find it worth while to suggest "*Change to* PHILIP MORRIS."... by far the wisest choice for everyone who smokes.

PHILIP MORRIS

Philip Morris & Co., Ltd., Inc.
119 Fifth Avenue, N. Y.

DO YOU SMOKE A PIPE? We suggest an unusually fine blend — COUNTRY DOCTOR PIPE MIXTURE. Made by the same process as used in the manufacture of Philip Morris Cigarettes.

*Completely documented evidence on file.
**May we send you copies of these published studies:

Laryngoscope, Feb. 1935, Vol. XLV, No. 2, 149-154; Laryngoscope, Jan. 1937, Vol. XLVII, No. 1, 58-60; Proc. Soc. Exp. Biol. and Med., 1934, 32-241; N. Y. State Journ. Med., Vol. 35, 6-1-25, No. 11, 590-592.

RIASOL
a step forward in PSORIASIS

Countless physicians relieve psoriasis by prescribing RIASOL. Not only do the unsightly patches yield to this effective formula in the majority of cases, but recurrences are usually fewer.

With the fading of the ugly psoriatic lesions, patients experience cosmetic relief that greatly enhances self-confidence. RIASOL is also a welcome prescription because it is so pleasant, simple and convenient to use.

RIASOL contains 0.45% mercury chemically combined with soaps, 0.5% phenol and 0.75% cresol in a washable, non-staining, odorless vehicle.

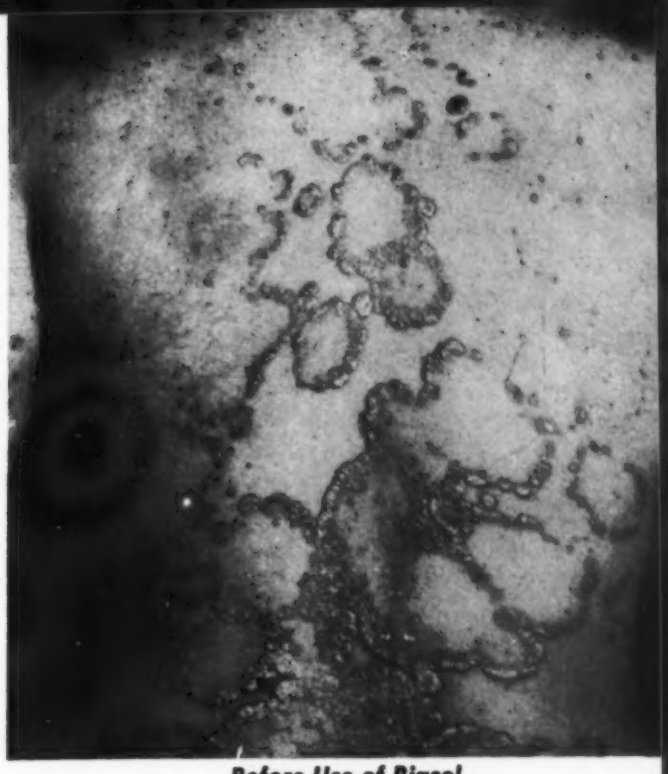
Apply daily after a mild soap bath and thorough drying. A thin, invisible, economical film suffices. No bandages necessary. After one week, adjust to patient's progress.

RIASOL is never advertised to the laity. Supplied in 4 and 8 fld. oz. bottles, at pharmacies or direct.

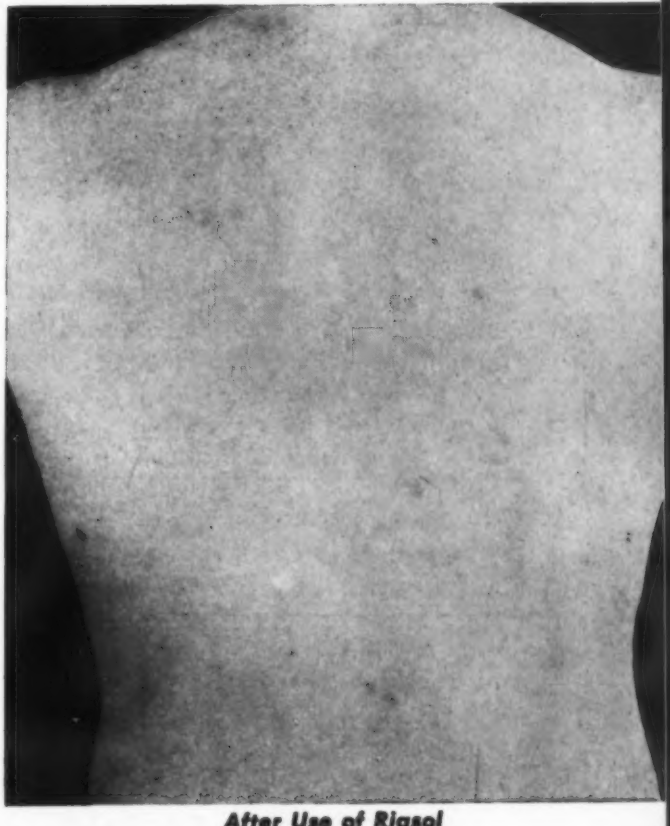
Mail coupon for your free clinical package. One trial will convince you of RIASOL'S potentialities.

ANNOUNCEMENT

New 64-page brochure on PSORIASIS—The Disease and Its Treatment, now being mailed to all physicians. WATCH FOR YOUR COPY!



Before Use of Riasol



After Use of Riasol

SHIELD LABORATORIES IM-10-48
12850 Mansfield Avenue, Detroit 27, Michigan

Please send me professional literature and generous clinical package of RIASOL.

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City _____ Zone _____ State _____

Druggist _____ Address _____

RIASOL for PSORIASIS

REMINDER

(Courtesy Mother Nature)

THE TURN of summer into fall is Nature's most poignant reminder of another year gone by.

It's a reminder that should make you think, seriously, that you yourself are a year closer to the autumn of your own particular life.

What steps have you taken . . . what plan do you have . . . for comfort and security in those later years?

You *can* have a very definite plan—one that's automatic and *sure*.

If you're on a payroll, sign up to buy U. S. Savings Bonds on the Payroll Plan, through regular deductions from your wages or salary.

If you're not on a payroll but have a bank account, get in on the Bond-A-Month Plan for buying Bonds through regular charges to your checking account.

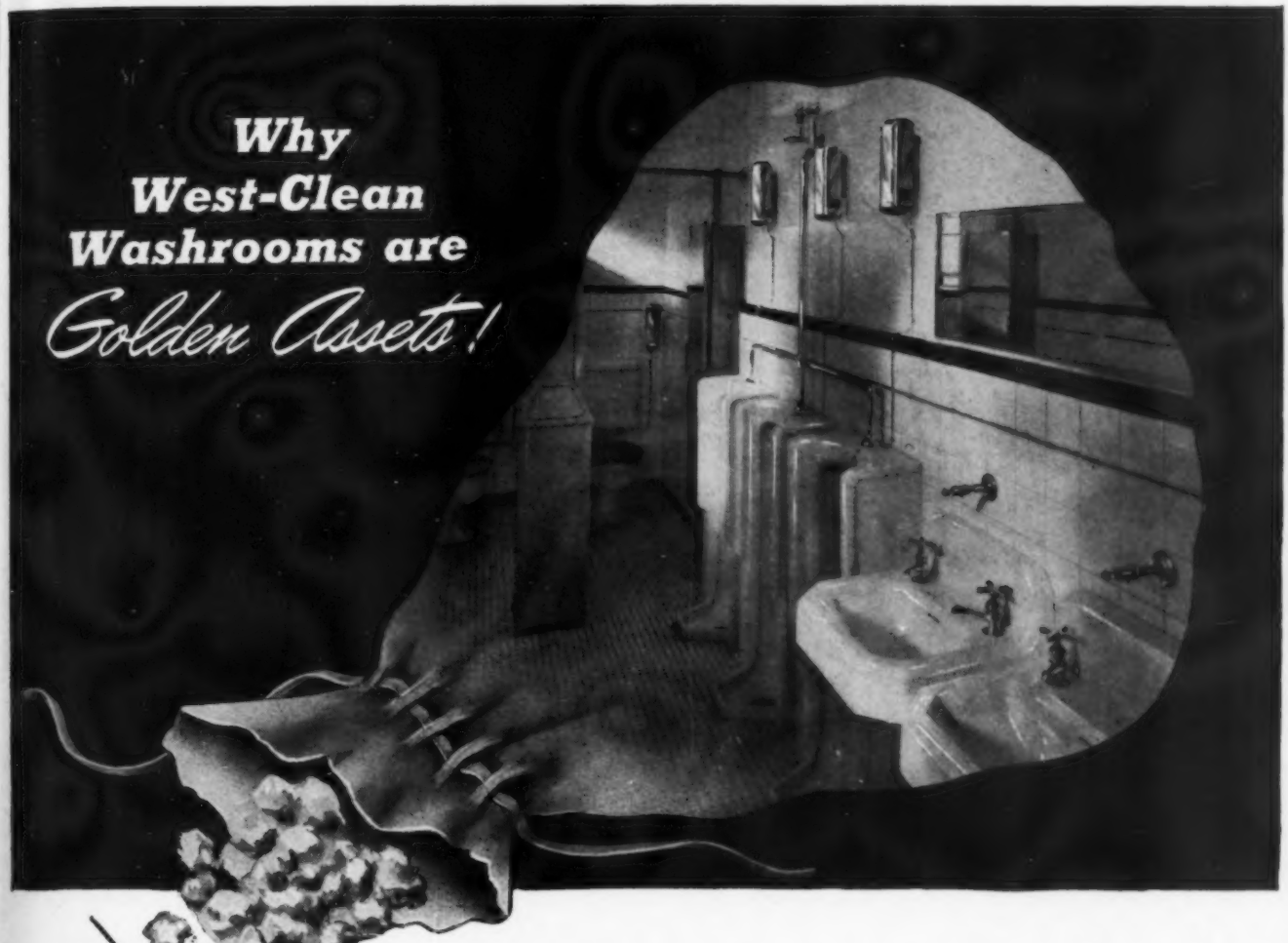
Do this . . . stick to it . . . and every fall will find you richer by even more than you've set aside. For your safe, sure investment in U. S. Savings will pay you back—in ten years—$100 for every $75 you've put in.

AUTOMATIC SAVING IS SURE SAVING—

U.S. SAVINGS BONDS

Contributed by this magazine in co-operation with the Magazine Publishers of America as a public service.

Why West-Clean Washrooms are *Golden Assets!*



One immaculately clean washroom may frequently go a longer way to furthering employe relations than a half dozen "trouble-shooting" conferences. Employe health, loyalty, and heightened operating efficiency always go hand in hand with clean, comfortable working conditions. Before it can pass employe inspection, however, a washroom must be *fully clean — not just half clean!*

Here's where West Washroom Service really "shines." Where your own janitors, due to lack of time and proper equipment, merely scrape the surface of your washroom problem . . . a trained West service man literally gets to the "bottom" of it. By thoroughly cleaning the traps and bowls, he *eradicates* the *hidden* cause of annoying washroom odors.

Periodic, efficient and complete — including installation of a modern method of automatic deodorization — this service is extremely economical. Costs nothing extra with your purchase of necessary West Products.

Close to 500 trained West Representatives from coast to coast are ready to explain the merits of this superior service in full detail. For a quick solution to your washroom problem, contact us at once.

A handsomely illustrated brochure is now available upon request. Just fill in the coupon below to discover how your washroom maintenance costs can be greatly reduced — and how you can obtain the *Free* services of trained West service men.

PLEASE CLIP TO YOUR BUSINESS LETTERHEAD

WEST DISINFECTING *Company*

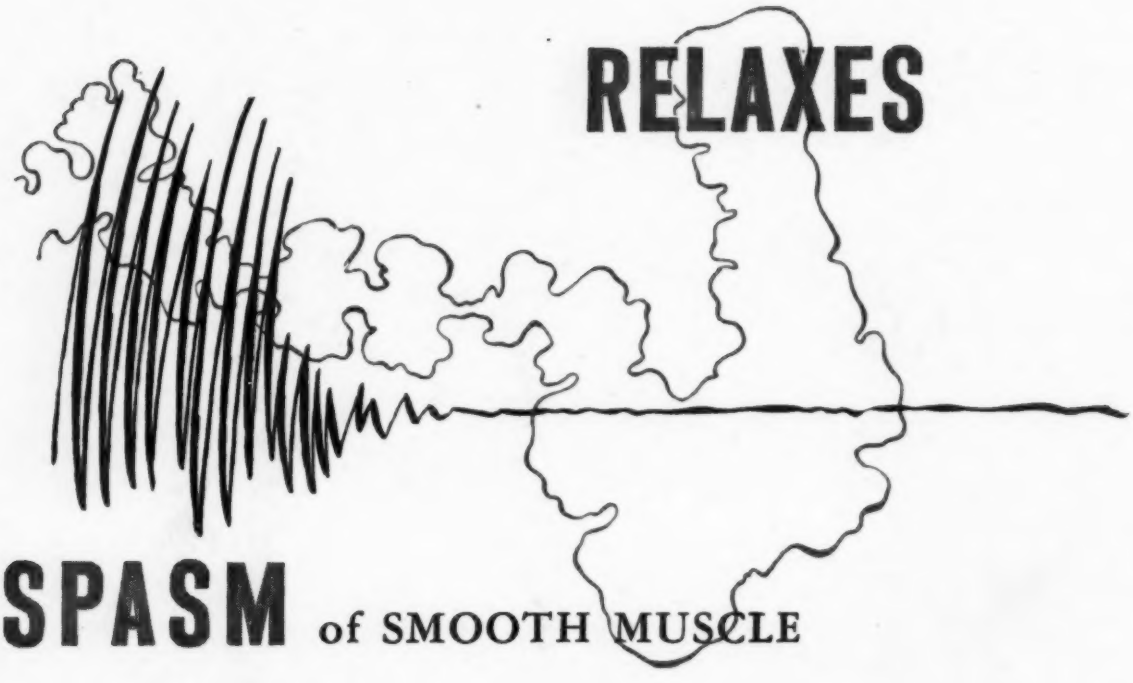
42-16 WEST ST., LONG ISLAND CITY 1, N.Y.

I would like a copy of "An Ideal Washroom Maintenance Service"

NAME_____

POSITION_____

TRASENTINE-PHENOBARBITAL



Trasentine acts selectively on the smooth muscle "receptive substance" associated with parasympathetic nerve endings in the abdominal viscera—a fact that explains the relative absence of those side effects so often produced by atropine or belladonna. The neuro-musculotropic action of Trasentine is enhanced by the mild sedative effect of phenobarbital.

Trasentine-Phenobarbital tablets contain Trasentine 50 mg. with phenobarbital 20 mg.

- Trasentine is also available without phenobarbital in tablets of 75 mg., suppositories of 100 mg., and ampuls of 50 mg.

Ciba

TRASENTINE (brand of adiphenine) Trade Mark Reg. U.S. Pat. Off.

CIBA PHARMACEUTICAL PRODUCTS, INC., SUMMIT, NEW JERSEY
2/1376M